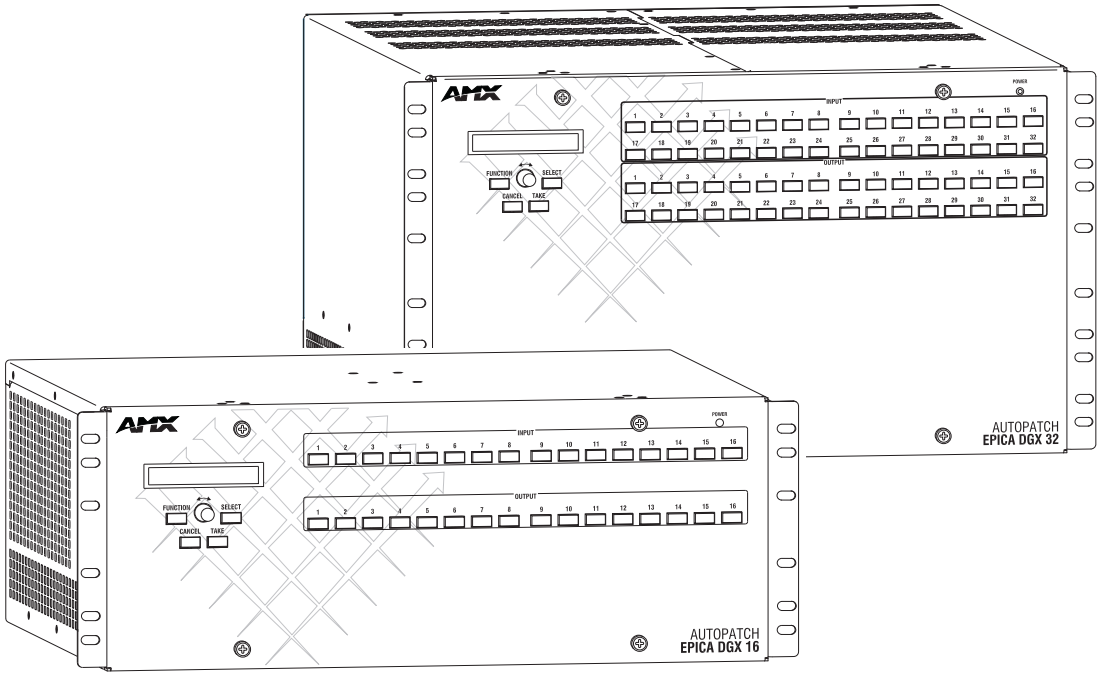
Instruction Manual

Epica DGX 16
Epica DGX 32

Distribution Matrix



AutoPatch Matrix Switchers

REV B1: 1/25/2011

AMX Limited Warranty and Disclaimer

This Limited Warranty and Disclaimer extends only to products purchased directly from AMX or an AMX Authorized Partner which include AMX Dealers, Distributors, VIP's or other AMX authorized entity.

AMX warrants its products to be free of defects in material and workmanship under normal use for three (3) years from the date of purchase, with the following exceptions:

- LCD Panels are warranted for three (3) years, except for the display and touch overlay components are warranted for a period of one (1) year.
- Disk drive mechanisms, pan/tilt heads, power supplies are warranted for a period of one (1) year.
- AMX lighting products are guaranteed to switch on and off any load that is properly connected to our lighting products, as long as the AMX lighting products are under warranty. AMX also guarantees the control of dimmable loads that are properly connected to our lighting products. The dimming performance or quality there of is not guaranteed, due to the random combinations of dimmers, lamps and ballasts or transformers.
- AMX software is warranted for a period of ninety (90) days.
- Batteries and incandescent lamps are not covered under the warranty.
- AMX AutoPatch Epica, Modula, Modula Series 4, Modula Cat Pro Series and 8Y-3000 product models will be free of defects in materials and manufacture at the time of sale and will remain in good working order for a period of three (3) years following the date of the original sales invoice from AMX. The three-year warranty period will automatically be extended to the life of the product (Limited Lifetime Warranty). The life of the product extends until five (5) years after AMX ceases manufacturing the product model. The Limited Lifetime Warranty applies to products in their original installation only. If a product is moved to a different installation, the Limited Lifetime Warranty will no longer apply, and the product warranty will instead be the three (3) year Limited Warranty.

Note: *The complete Warranty is at* ***www.amx.com****.*

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ESD Warning

To avoid ESD (Electrostatic Discharge) damage to sensitive components, make sure you are properly grounded before touching any internal materials.

When working with any equipment manufactured with electronic devices, proper ESD grounding procedures must be followed to make sure people, products, and tools are as free of static charges as possible. Grounding straps, conductive smocks, and conductive work mats are specifically designed for this purpose.

Anyone performing field maintenance on AMX AutoPatch equipment should use an appropriate ESD field service kit complete with at least a dissipative work mat with a ground cord and a UL listed adjustable wrist strap with another ground cord. These items should not be manufactured locally, since they are generally composed of highly resistive conductive materials to safely drain static charges, without increasing an electrocution risk in the event of an accident. ESD protective equipment can be obtained from 3M™, Desco®, Richmond Technology®, Plastic Systems®, and other such vendors.

Important Safety Information and Instructions

When using and installing your AMX AutoPatch product, adhere to the following basic safety precautions. For more information about operating, installing, or servicing your AMX AutoPatch product, see your product documentation.

- Read and understand all instructions before using and installing AMX AutoPatch products.
- Use the correct voltage range for your AMX AutoPatch product.
- There are no user serviceable parts inside an AMX AutoPatch product; service should only be done by qualified personnel.
- If you see smoke or smell a strange odor coming from your AMX AutoPatch product, turn it off immediately and call technical support.
- For products with multiple power supplies in each unit, make sure all power supplies are turned on simultaneously.
- Use surge protectors and/or AC line conditioners when powering AMX AutoPatch products.
- Only use a fuse(s) with the correct fuse rating in your enclosure.
- Make sure the power outlet is close to the product and easily accessible.
- Make sure the product is on or attached to a stable surface.
- Turn off equipment before linking pieces together, unless otherwise specified in that product's documentation.
- For safety and signal integrity, use a grounded external power source and a grounded power connector.
- Turn off and unplug an enclosure before adding or removing boards, unless otherwise specified in that product's documentation.
- To avoid shock or potential ESD (Electrostatic Discharge) damage to equipment, make sure you are properly grounded before touching components inside an AMX AutoPatch product.

Information et directives de sécurité importantes

Veuillez vous conformer aux directives de sécurité ci-dessous lorsque vous installez et utilisez votre appareil AMX AutoPatch. Pour de plus amples renseignements au sujet de l'installation, du fonctionnement ou de la réparation de votre appareil AMX AutoPatch, veuillez consulter la documentation accompagnant l'appareil.

- Lisez attentivement toutes les directives avant d'installer et d'utiliser les appareils AMX AutoPatch.
- Le voltage doit être approprié à l'appareil AMX AutoPatch.
- Les appareils AMX AutoPatch ne contiennent aucune pièce réparable par l'usager; la réparation ne doit être effectuée que par du personnel qualifié.
- Si de la fumée ou une odeur étrange se dégagent d'un appareil AMX AutoPatch, fermez-le immédiatement et appelez le Service de soutien technique.
- Veillez à ce que tous les blocs d'alimentation des appareils dotés de blocs d'alimentation multiples dans chaque unité soient allumés simultanément.
- Servez-vous de protecteurs de surtension ou de conditionneurs de lignes à courant alternatif lorsque vous mettez les appareils AMX AutoPatch sous tension.
- Placez uniquement des fusibles de calibre exact dans les boîtiers.
- Veillez à ce que la prise de courant soit proche de l'appareil et facile d'accès.
- Veillez à ce que votre appareil AMX AutoPatch soit installé sur une surface stable ou qu'il
  y soit fermement maintenu.
- Fermez toutes les composantes de l'équipement avant de relier des pièces, à moins d'indication contraire fournie dans la documentation de l'appareil.
- Par mesure de sécurité et pour la qualité des signaux, servez-vous d'une source d'alimentation externe mise à la terre et d'un connect d'alimentation mis à la terre.
- Fermez et débranchez le boîtier avant d'ajouter ou d'enlever des plaquettes, à moins d'indication contraire fournie dans la documentation du appareil.
- Pour éviter les chocs ou les dommages éventuels causés à l'équipement par une décharge électrostatique, veillez à ce le dispositif oit bien relié à la terre avant de toucher les composantes se trouvant à l'intérieur d'un appareil AMX AutoPatch.

Notices

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Further, this publication and features described herein are subject to change without notice.

US FCC Notice

The United States Federal Communications Commission (in 47CFR 15.838) has specified that the following notice be brought to the attention of the users of this product.

Federal Communication Commission Radio Frequency Interference Statement:

"This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case
the user will be required to correct the interference at his own expense.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the booklet, How to Identify and Resolve Radio-TV Interference Problems*, prepared by the Federal Communications Commission to be helpful."*

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock N. 004-000-00345-4.

Use shielded cables. To comply with FCC Class A requirement, all external data interface cables and adapters must be shielded.

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Switzerland requires the following notice for products equipped with lithium batteries. This notice is not applicable for all AMX equipment.

Upon shipment of products to Switzerland, the requirements of the most up-to-date Swiss Ordinance Annex 2.15 of SR 814.81 will be met including provision of the necessary markings, documents, and annual reports relative to the disposal of the batteries to the Swiss Authorities.

Warnings and Cautions

This manual uses the following conventions and icons to draw attention to actions or conditions that could potentially cause problems with equipment or lead to personal risk.

ESD Warning: *The icon to the left indicates text regarding potential danger associated with the discharge of static electricity from an outside source (such as human hands) into an integrated circuit, often resulting in damage to the circuit.*

Warning: *The icon to the left indicates text that warns readers against actions or conditions that could cause potential injury to themselves.*

Caution: *The icon to the left indicates text that cautions readers against actions that could cause potential injury to the product or the possibility of serious inconvenience.*

Overview and General Specifications

Applicability Notice

The information in this manual applies to the following Epica DGX 16 and 32 enclosures and Epica DGX 16 and 32 pre-engineered systems. It also applies to Epica DGX Input and Output Boards, which can be ordered separately. These boards are compatible in both the Epica DGX 16 and 32.

Note: *All Epica DGX 16 and 32 enclosures ship with a standard front control panel.*

Epica DGX 16 Enclosure (4 RU)

Configuration	FG #	Model
16x16	FG1057-16	AVS-EPDGX16-ENC

Epica DGX 32 Enclosure (6 RU)

Configuration	FG #	Model
32x32	FG1056-32	AVS-EPDGX32-ENC

Epica DGX 16 Pre-Engineered Systems (DVI Only)

Note: *All Epica DGX 16 pre-engineered systems contain DVI Input and Output Boards only.*

Configuration	FG #	Model
16x16	FGP57-1616-DD0	AVS-EPDGX16-1616-DD0
8x16	FGP57-0816-DD0	AVS-EPDGX16-0816-DD0
16x8	FGP57-1608-DD0	AVS-EPDGX16-1608-DD0

Epica DGX 32 Pre-Engineered Systems (DVI Only)

Note: *All Epica DGX 32 pre-engineered systems contain DVI Input and Output Boards only.*

Configuration	FG #	Model
16x16	FGP56-1616-DD0	AVS-EPDGX32-1616-DD0
16x24	FGP56-1624-DD0	AVS-EPDGX32-1624-DD0
16x32	FGP56-1632-DD0	AVS-EPDGX32-1632-DD0
24x16	FGP56-2416-DD0	AVS-EPDGX32-2416-DD0
24x24	FGP56-2424-DD0	AVS-EPDGX32-2424-DD0
24x32	FGP56-2432-DD0	AVS-EPDGX32-2432-DD0
32x16	FGP56-3216-DD0	AVS-EPDGX32-3216-DD0
32x24	FGP56-3224-DD0	AVS-EPDGX32-3224-DD0
32x32	FGP56-3232-DD0	AVS-EPDGX32-3232-DD0

Epica DGX 16 and 32 Input and Output Boards

For custom systems and for upgrading pre-engineered systems, the Epica DGX 16 and 32 currently each support two board types: SC Optical and DVI. Each board fills one slot and has four connectors. Within a system, a source connected to any of the input boards can be routed to any destination connected to any of the output boards.

- For general board information, see page 12 and page 35.
- For specific board information, see the applicable board chapter in this manual.

Epica DGX DVI Boards (see page 53)

Type	FG #	Model
Input	FG1056-520	AVS-EPDGX32-VI-DVI
Output	FG1056-530	AVS-EPDGX32-VO-DVI

Epica DGX SC Optical Boards (see page 47)*

Type	FG #	Model
Input	FG1056-500	AVS-EPDGX32-OI-SC
Output	FG1056-510	AVS-EPDGX32-OO-SC

* DGX SC Optical Boards are used in conjunction with DGX Fiber Transmitter and Receiver modules. For model numbers of the compatible modules, see page 48. For system setup information, see page 49.

Product Notes

The Epica DGX 16 and 32 are available in both pre-engineered (DVI only) and custom systems in a variety of input to output configuration sizes and can contain an assortment of input and output boards in a single enclosure. The Epica DGX 16 and 32 enclosures fit in a broad range of digital and analog environments and are controllable from a variety of sources.

Note: *Because the Epica DGX 16 and 32 Distribution Matrices are available in various board configurations, the illustrations in this manual may differ from the model(s) you purchased.*

Features of the Epica DGX 16 and 32

- The available input/output range for the Epica DGX 16 is 4x4 to 16x16 and for the Epica DGX 32 the range is 4x4 to 32x32 (both come in increments of 4 with upgrade potential).
- DGX Technology provides a common signal transport and matrix switching layer that transcodes between analog and digital signals.
- Supports uncompressed video resolutions up to 1920x1200 @ 60 Hz, including 1080p.
- Native NetLinx® device.
- AMX Device Discovery enabled through AMX's AutoPatch Duet module.
- Designed for use with single strand multimode fiber.
- Use in conjunction with DGX Fiber Transmitters and Receivers to send video, audio, and one-way control over a single fiber cable up to 6,000 feet (1828.8 m) – 3,000 feet (914.4 m) to the Epica DGX 16 or 32 and 3,000 feet after the Epica DGX 16 or 32.
- DGX SC Optical Boards support RGBHV, RGBS, RGsB, and Y/Pb/Pr (Y/Pb/Pr including 1080p) video and DVI formats, depending on the type of DGX Fiber modules used with them.
- DGX SC Optical Boards support embedded analog stereo audio signals (unbalanced stereo @ a sample rate of 48 kHz) and digital audio signals (PCM over S/PDIF @ 32 kHz, 44.1 kHz, 48 kHz, as well as 96 kHz, which requires a minimum video resolution of 800x600 @ 60 Hz).
- DGX SC Optical Boards also support unidirectional (source to destination) serial data.
- DGX DVI Boards only – provides increased power on every output for use with external DVI extenders.

Features of the Epica DGX 16 and 32 (continued)

- Compatible DGX Fiber Receivers feature SmartScale™ Technology which automatically responds to the display's declared EDID information and scales the video to the best resolution and video parameters for that display without manual setup.
- Pre-loaded with the most common EDID settings on each matrix switcher input connector (other than fiber connectors) to emulate display response when queried, which makes sure transmission of the video from the source device is working.
- Custom EDID settings can be loaded on each DVI input with the included EDID Programmer.
- System self-diagnostics (power monitoring, fan control and monitoring, signal and temperature sensing); plus ships with APDiagnostics software (monitors, displays, and collects advanced diagnostic information).
- Virtual matrices (levels) / groupings; ships with free matrix switcher configuration software.
- RJ-45 Ethernet (Enc Link) ports support linking to AMX AutoPatch matrix switchers.
- Local presets allow quick recall of a pre-programmed set of switches with a single command; multiple presets can exist within a system at the same time.
- Global presets allow quick recall of a comprehensive snapshot of all switches.
- Standard RS-232 (Control) port.
- USB (mini-B) port can be used as a virtual Com port for serial communication with a PC.
- Fully redundant (hot-swappable) power supplies (RPS) with independent power paths for maximum reliability.
- Rack mounting ears integral to product design.
- AMX Limited Lifetime Warranty included (see **www.amx.com** or the *AMX AutoPatch CD*).
- 24-hour technical support.

Control Features for the Epica DGX 16 and 32

In addition to the front control panel, which is used for controlling the system's switches and system attributes, several control options are available. Multiple control methods can be used on the same system.

- Front control panel (standard on all enclosures)
- Compatible with a number of AMX control devices (for control programming information, see the instruction manual for the specific interface)
- APControl 3.0.1 software (free with all systems) provides easy single-user PC control
- Control via NXB-AP-1000 interface (server connection through TCP/IP port on CPU)
- Supports AMX AutoPatch's simple BCS* serial control protocol
- Supports AMX AutoPatch's XNNet protocol
- Supports third-party controllers

* BCS (Basic Control Structure) is sent as ASCII characters through the RS-232 port.

Note: *Features and specifications described in this document are subject to change without notice.*

Front View

The enclosure, which is the structural basis of the Epica DGX 16 and 32 Distribution Matrices, can be controlled using the standard front control panel, control software, or an external controller (for additional information on control options, see page 15 and for control panel operation, see page 57). The Power LED indicates the status of the power supplies.

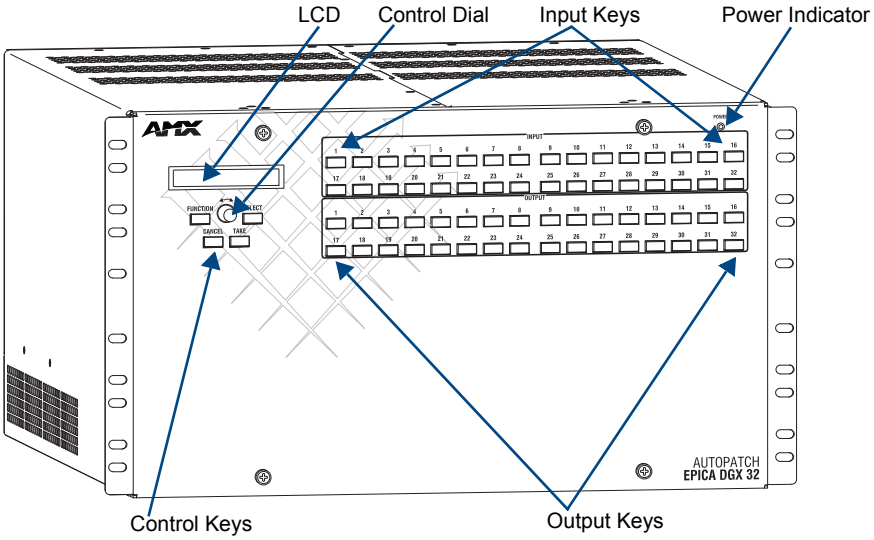


FIG. 1 Front view of an Epica DGX 32 enclosure

Power LED on Front of Enclosure

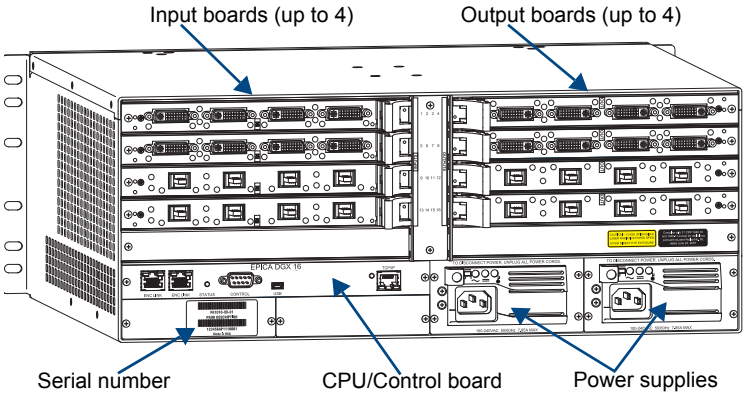
The Power LED indicates the power status of the redundant power system within the Epica DGX 16 and 32 enclosure as follows:

- Green – both power supplies are powered on
- Red – one of the power supplies is not receiving power or has failed
- Off – both power supplies are not receiving power

Rear View

The enclosure's appearance, as viewed from the rear, will vary depending on the number and types of input and output boards present. The Epica DGX 16 enclosure in FIG. 2 is fully loaded for 16x16 switching. The Epica DGX 32 enclosure in FIG. 3 is partially loaded for 28x28 switching.

Epica DGX 16



Note: *Empty input or output board slots (which are numbered for expansion) can be used to upgrade system.*

FIG. 2 Rear view of a full Epica DGX 16 enclosure

Epica DGX 32

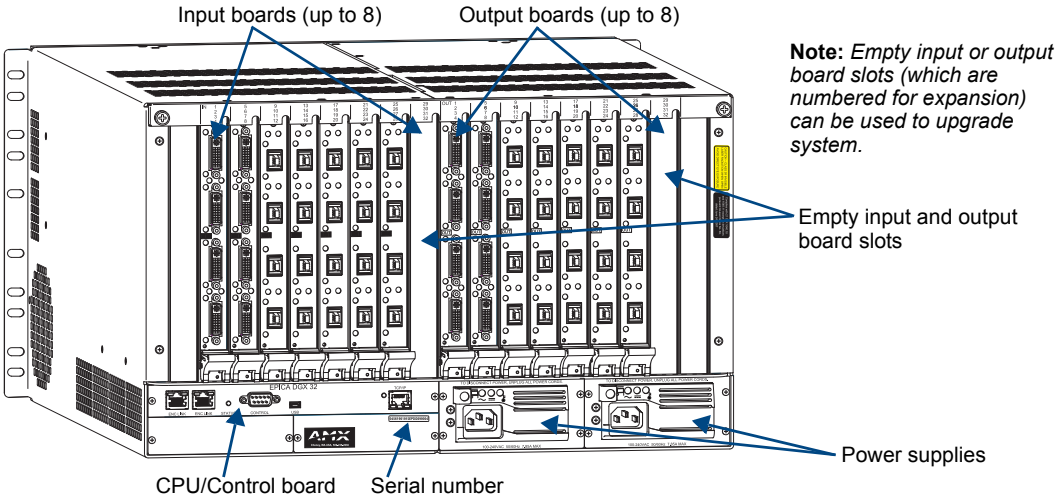

Input boards (up to 8)
Output boards (up to 8)
Note: Empty input or output board slots (which are numbered for expansion) can be used to upgrade system.
Empty input and output board slots
Power supplies
CPU/Control board
Serial number

FIG. 3 Rear view of an Epica DGX 32 enclosure with room for expansion

Rear View Components

- Input and output boards (some slots may be empty, depending on the configuration)
- CPU/Control board
- Two standard redundant power supplies
- Serial number

The following sections briefly introduce the hardware on the rear of the enclosure.

CPU/Control Board

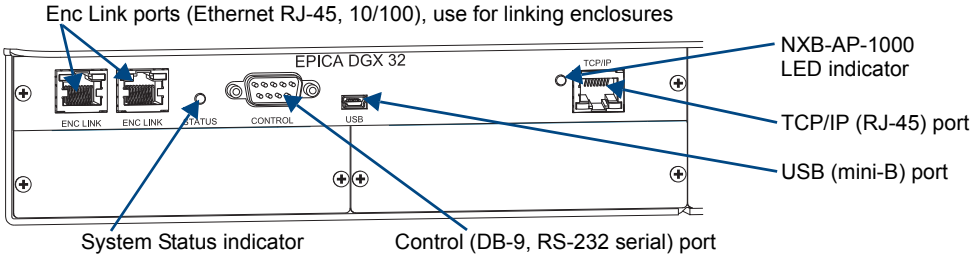


FIG. 4 CPU/Control board

The CPU/Control board (FIG. 4) is on the left rear of the enclosure, directly below the input connectors. Each CPU includes the following port options:

- Enc Link port (Ethernet RJ-45) – for linking to other types of enclosures (see page 24)
- Control port (DB-9, RS-232) – for attaching an external control device (see page 29)
- USB (mini-B) port – for attaching an external control device (see page 32)
- TCP/IP (RJ-45) port – for establishing an NXB-AP-1000 connection (see page 42)

Each CPU includes two main LED indicators:

- System Status indicator (between the Enc Link ports and the Control port) – for system status
- NXB-AP-1000 LED Indicator (left of TCP/IP port) – indicates an active connection

Power Supply Units

Each of the power supply units on the rear of the enclosure (FIG. 5) has a power receptacle that will accept all major international standard power sources. (US power cords are included with all shipments unless ordered otherwise.) Maximum power specifications are provided on the power supply receptacles.

For information on applying power, see page 36.

The power supply unit has three LED indicators (in order from left to right):

- AC (~): When the LED is green, the power is good.
- DC (⎓): When the LED is green, the power is good.
- Temperature ( ): When the LED is not illuminated, the temperature is good; when the LED is amber, the temperature is above normal.

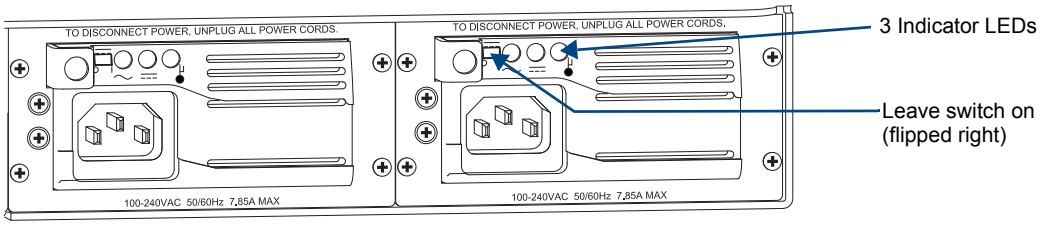

TO DISCONNECT POWER, UNPLUG ALL POWER CORDS.
TO DISCONNECT POWER, UNPLUG ALL POWER CORDS.
100-240VAC 50/60Hz 7.85A MAX
100-240VAC 50/60Hz 7.85A MAX
3 Indicator LEDs
Leave switch on
(flipped right)

FIG. 5 Power supply receptacles, LEDs, and switches

Caution: *Each power supply has a small toggle switch to the left of its LEDs that controls internal power and must remain flipped to the right for the system to operate. Do not flip this switch to the left.*

Input and Output Boards

A single enclosure can handle a combination of signals: the DVI boards support DVI-D signals, and the SC Optical boards support DVI-D, analog video,* and digital or analog stereo audio signals. All signals are automatically converted to the output device's format, with DGX Fiber Modules used in the conversion process for the DGX SC Optical boards.

* Supported analog video signals include RGBHV, RGBS, RGsB, and Y/Pb/Pr.

Epica DGX 16

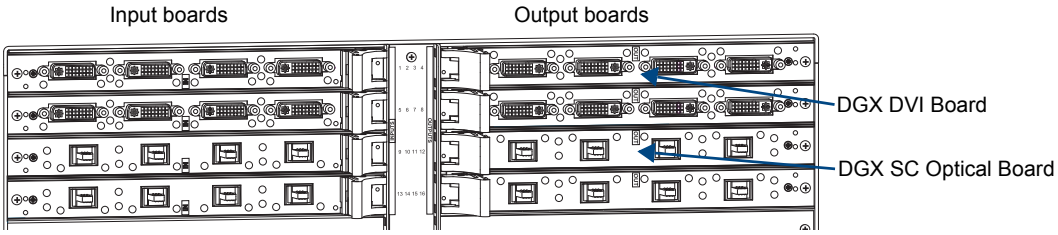


FIG. 6 DGX DVI and DGX SC Optical Input and Output Boards

Epica DGX 16 enclosures have 8 horizontal board slots (4 slots each for input and output boards with four connectors each), allowing for a maximum configuration of 16x16.

Epica DGX 32

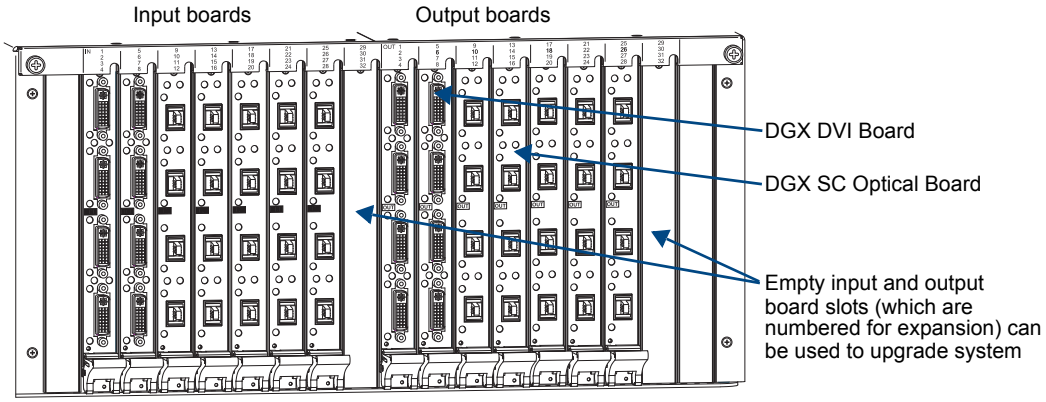

Input boards
Output boards
DGX DVI Board
DGX SC Optical Board
Empty input and output board slots (which are numbered for expansion) can be used to upgrade system

FIG. 7 DGX DVI and DGX SC Optical Input and Output Boards

Epica DGX 32 enclosures have 16 vertical board slots (8 slots each for input and output boards with four connectors each), allowing for a maximum configuration of 32x32.

For information on the boards included in your system, including connector types, cabling directions, and specifications, see the specific board chapter in this manual. If a system has empty board slots, the slots can be used to upgrade the system. For information on adding or replacing boards, see "Appendix E – Board Replacement" on page 145.

Input and Output Connectors

The connectors on the input and output boards are the attachment points for source and destination devices that connect to the system. Viewed from the rear of the enclosure, the input connectors (for attaching sources) are on the left, and the output connectors (for attaching destinations) are on the right.

Input and output channel numbers correspond to the connectors and are located as follows:

- Epica DGX 16 – on the vertical numbering plate (metal strip) between the input and output connectors.
- Epica DGX 32 – on the horizontal numbering plate (metal strip) directly above the connectors.

Serial Number

The serial number is normally located on the rear of the enclosure on the left (FIG. 2 on page 10 and FIG. 3 on page 11). Before installation, we recommend recording the serial number for each enclosure (and for each module if applicable) in the system in an easily accessible location.

Epica DGX 16 General Specifications

Specifications	
Parameter	**Value**
Approvals	CE, UL, cUL, FCC Class A, RoHS
AC Power per Supply	100 VAC to 240 VAC single phase, 50 Hz to 60 Hz
Power Consumption (max.)	785 Watts
Power Consumption (typical)	210 Watts, fully loaded enclosure
Thermal Dissipation (max.)	2679 BTU/hr.
Thermal Dissipation (typical)	717 BTU/hr, fully loaded enclosure
Operational Temperature	32° F to 113° F (0° C to 45° C)
Storage Temperature	-22° F to 158° F (-30° C to 70° C)
Humidity	0 to 90% non-condensing
MTBF	170,000 hours
Dimensions	15 in. (38.1 cm) depth; 16 in. (40.64 cm) with extractors 19 in. (48.26 cm) width including integral rack mounting ears 6.84 in. (17.37 cm) height (4 RU)
Weight	Approximately 34 lb. (15.4 kg) per loaded enclosure
Shipping Weight	Approximately 40 lb. (18.1 kg) per loaded enclosure
Compatible Fiber Modules	AMX AutoPatch DGX Fiber TX and DGX Fiber RX modules

Epica DGX 32 General Specifications

Specifications	
Parameter	**Value**
Approvals	CE, UL, cUL, FCC Class A, RoHS
AC Power per Supply	100 VAC to 240 VAC single phase, 50 Hz to 60 Hz
Power Consumption (max.)	785 Watts
Power Consumption (typical)	445 Watts, fully loaded enclosure
Thermal Dissipation (max.)	2679 BTU/hr.
Thermal Dissipation (typical)	1518 BTU/hr., fully loaded enclosure
Operational Temperature	32° F to 113° F (0° C to 45° C)
Storage Temperature	-22° F to 158° F (-30° C to 70° C)
Humidity	0 to 90% non-condensing
MTBF	102,000 hours
Dimensions	20.08 in. (51 cm) depth; 21.08 in. (53.54 cm) with extractors 19 in. (48.26 cm) width including integral rack mounting ears 10.45 in. (26.54 cm) height (6 RU)
Weight	Approximately 60 lb. (27.2 kg) per loaded enclosure
Shipping Weight	Approximately 70 lb. (31.8 kg) per loaded enclosure
Compatible Fiber Modules	AMX AutoPatch DGX Fiber TX and DGX Fiber RX modules

For individual board information and specifications, see the specific board chapter in this manual.

- DGX SC Optical Boards – see page 47
- DGX DVI Boards – see page 53

Note: *Features and specifications described in this document are subject to change without notice.*

Configuration Information and Control Options

The configuration file contains routing and control information for an AMX AutoPatch Routing System. Each system is programmed (configured) at the factory according to customer specifications.

Configuration Information

As shipped from the factory, the Epica DGX 16 and 32 support Device Discovery. The factory configuration contains two virtual matrices (VMs) for switching signals: VM 0 = all signals and VM 1 = video signals (in systems like the Epica DGX 16 and 32, both VMs normally route the same signals).

Note: *When audio is transmitted along with the video over the fiber, the audio switches on the same VM as the video (the audio and video cannot be switched independently).*

The custom configuration file is provided on the *AMX AutoPatch CD* that is shipped with each system. XNConnect, the configuration software provided on the CD, can be used to further customize the configuration file (see page 115).

Unless you need to modify your system, you will not need to use any of the configuration software that is included on the CD. If you do modify the configuration file, we recommend making a copy of it first.

Configuration file modifications include creating local presets and setting the Control Panel password, as well as adding or managing hardware. Configuration file modifications are made with XNConnect, which graphically displays the AMX AutoPatch system and its control configuration.

Control Options

Note: *The Epica DGX 16 and 32 support full Device Discovery through AMX's AutoPatch Duet module (see page 125).*

Control Panel

The Control Panel (see page 57) is standard on all Epica DGX 16 and 32 enclosures.

Note: *When using the control panel on an Epica DGX 16 or 32 to control a larger matrix switcher in a linked system, the number of inputs and outputs that can be controlled on the larger matrix switcher cannot be greater than the number of ones available on the Epica DGX 16 or 32. The virtual matrices on the larger matrix switcher must be configured accordingly.*

In addition to the Control Panel, the following external methods of control are available.

AMX Control Devices

The Epica DGX 16 and 32 are compatible with a number of AMX control devices via Native NetLinx communication. For control programming information, see the instruction manual for the specific interface.

Control Software

Epica DGX 16 and 32 enclosures can be controlled using AMX AutoPatch software:

- APControl 3.0.1 – for control and scheduling
  - Runs on a PC connected to the serial port or to the USB port (must be established as a virtual Com port); both ports are located on the CPU
  - Download from the *AMX AutoPatch CD* or from **www.amx.com**
- NXB-AP-100 Interface (XBar) – for control
  - Runs on the NXB-AP-1000 (the PC is connected to the TCP/IP port on the CPU)
  - The server delivers HTML pages for setting up the system and a Java control applet, which allows for remote control of an AMX AutoPatch Routing System using PC-based Internet browsing software

BCS Serial Control Protocol

The Epica DGX 16 and 32 can be controlled with an external serial controller. AMX AutoPatch has developed a command language, BCS* (Basic Control Structure) protocol, for programming control operations and for diagnostic purposes.

- External Serial Controllers – for control using BCS protocol
  - Serial control (sends and receives ASCII characters)
  - Uses the serial port or the USB port (as a virtual Com port); both are located on the CPU
  - Commands can be entered into a terminal emulation program (such as Windows© HyperTerminal) on a PC

* For information on BCS commands, see the *Instruction Manual – BCS Basic Control Structure Protocol* on the *AMX AutoPatch CD* or at **www.amx.com**.

Third-Party Controllers

A third-party controller can also be attached to an Epica DGX 16 or 32 enclosure via the RS-232 serial port. If using a third-party controller, see the controller documentation for operating instructions.

XNNet Protocol

Advanced programmers who want to design their own control programs can use XNNet protocol. The *AMX AutoPatch CD* includes the XNNet Communication Library that supports C, Java, and Visual Basic with examples of the XNNet protocol in use.

System Diagnostic Options

The two system diagnostic options for the Epica DGX 16 and 32 are APDiagnostics software and a programmer's interface, which displays in a splash screen.

APDiagnostics

APDiagnostics is a software application that monitors and displays advanced diagnostic information about the Epica DGX 16 and 32. This application is available on the *AMX AutoPatch CD* or at **www.amx.com**. APDiagnostics also works with other AMX AutoPatch products that are capable of reporting such data. For information on APDiagnostics, see Appendix C on page 127.

Programmer's Interface for System Diagnostics

The Epica DGX 16 and 32 display system information in their splash screens for diagnostic purposes. The information indicates the current status and well-being of the system components. The splash screen can be accessed using a terminal emulation program, such as HyperTerminal. For information on the programmer's interface, see Appendix D on page 139.

Installation and Setup

UL Safety Certifications, Notices, and Recommendations for Laser Products

Per UL requirements, make note of the following:

- The DGX SC Optical Boards comply with IEC Standard: IEC 60825-1, 2001.
- The boards also comply with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.
- The DGX SC Optical Output (TX) Boards are CLASS 1 LASER PRODUCTS.
- The maximum output power of the laser radiation is 4.08 mW.

Since the class of radiation emitted from the fiber port can be Class 3R when the fiber cable or dust plug is removed, a yellow and black label with the following caution is located on the rear of the enclosure on the far right.

FIG. 8 Caution label for Class 3R laser products

Important: *No user serviceable parts are included inside an AMX AutoPatch product; service should only be done by qualified personnel.*

Caution: *Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.*

Exercise caution when installing DGX products to avoid direct eye exposure to invisible laser radiation. Follow the recommendations below whenever installing or working with DGX products.

- ❑ Be sure to apply the power only after all fiber connections are made and no fiber ends are exposed.
- ❑ Do *not* remove dust plugs from SC fiber connectors or the dust caps from the fiber cables until establishing connections; avoid direct eye exposure.
- ❑ Make sure all cables, including fiber cables, are correctly connected and/or terminated.
- ❑ Before you unplug a fiber cable on an input board, disconnect the power on the DGX TX that is connected to the input.
- ❑ Before you unplug a fiber cable on an output board, disconnect the switch for that output connector.

Site Recommendations

When placing the enclosure, follow the recommendations and precautions in this section to reduce potential installation and operation hazards.

Environment

- ❑ Choose a clean, dust free, (preferably) air-conditioned location.
- ❑ Avoid areas with direct sunlight, heat sources, or high levels of EMI (Electromagnetic Interference).

Chassis Accessibility

Make sure the front and rear panels of the enclosure are accessible, so that you can monitor the Power indicator LED on the front and the other LED indicators on the rear. Leaving adequate clearance at the rear will also allow for easier cabling and service.

Power

Important: *We recommend attaching all power cords to a surge protector (20 A) and/or an AC line conditioner.*

The source's electrical outlet should be installed near the router, easily accessible, and properly grounded. Power should come from a building branch circuit. We strongly recommend using a dedicated line for the system's power. Use a minimum breaker current rating of 20 A for 110 V or 10 A for 230 V.

To avoid an overload, note the power consumption rating of all the equipment connected to the circuit breaker before applying power.

General Hazard Precautions

These recommendations address potential hazards that are common to all installations:

Elevated Operating Temperature

The maximum rated ambient temperature for Epica DGX 16 and 32 enclosures is 113° F (45° C).

All equipment should be installed in an environment compatible with the manufacturer's maximum rated ambient temperature. In a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the ambient room temperature.

Caution: *To protect the equipment from overheating, do not operate in an area that exceeds 113° F (45° C) and follow the clearance recommendation below for adequate airflow.*

Airflow Restriction

Epica DGX 16 and 32 enclosures are designed to adequately dissipate the heat they produce under normal operating conditions; however, this design is defeated when high heat producing equipment is placed directly above or below an enclosure.

Caution: *To prevent overheating, avoid placing high heat producing equipment directly above or below the enclosure. The system requires a minimum of one empty rack unit above and below (three empty rack units are recommended). Verify that the openings on the top and sides of the enclosure are not blocked and do not have restricted air flow.*

Mechanical (Rack) Loading

When installing equipment in a rack, distribute the weight to avoid uneven mechanical loading. Note that the Epica DGX 16 weighs approximately 34 pounds (15.4 kg) fully loaded, and the Epica DGX 32 weighs approximately 60 pounds (27.2 kg) fully loaded.

Circuit Overloading

When connecting the equipment to the supply circuits, be aware of the effect that overloading the circuits might have on over-current protection and supply wiring.

Reliable Earthing (Grounding)

Reliable earthing of rack-mounted equipment should be maintained. If not using a direct connection to the branch circuit (e.g., plugging into a power strip), pay particular attention to supply connections.

Caution: *We strongly recommend attaching all of the power cords to a surge protector and/or an AC line conditioner. After powering up the enclosure, apply power to the source and destination devices.*

Unpacking

The Epica DGX 16 and 32 are shipped with one enclosure per shipping box. The invoice is sent separately; a packing slip is attached to the outside of each box. Each box contains the following items:

- ❑ Epica DGX 16 or 32 enclosure
- ❑ Two standard US power cords (if shipped within the US)
- ❑ Other enclosure products, as needed

The documentation in the first box includes:

- ❑ AMX AutoPatch Epica DGX 16 and 32 Distribution Matrices Quick Start Guide
- ❑ Control Panel Custom Label Kit (for inputs and outputs and for LCD Function menu)
- ❑ *AMX AutoPatch CD*

For orders comprising multiple enclosures, the shipping boxes are marked as "Chassis __ of __," where the first blank is the box number and the second blank is the total number of boxes in the shipment.

Important: *If applicable, the shipping boxes each have a bright yellow/green sticker that states that the unit (enclosure) is part of a multiple-enclosure system and must be installed with the same serial numbers.*

Unpacking Tips

- ❑ Before fully unpacking the enclosure, *inspect the shipping box for any signs of damage*. If a box is partially crushed or any sides have been broken open, notify the shipping agency immediately and contact your AMX representative (see the warranty on the *AMX AutoPatch CD* or at **www.amx.com**).
- ❑ Once unpacking is complete, closely check the physical condition of the enclosure.
- ❑ Collect all documentation.

Note: *Please save the original shipping container and packing materials. AMX is not responsible for damage caused by insufficient packing during return shipment to the factory. Shipping boxes are available; contact your AMX representative for details.*

System Setup Options

The following table contains eight options for using DGX SC Optical and DGX DVI Boards in an Epica DGX 16 or 32 Matrix Switcher in conjunction with DGX Fiber modules.

Note: *DGX Fiber modules can also be used in a standalone, end-to-end solution; see the "Instruction Manual – DGX Transmitters & Receivers."*

System Setup Options – AMX AutoPatch Epica DGX Boards with DGX Fiber Modules			
DGX Fiber Module	**Epica DGX Input Board**	**Epica DGX Output Board**	**DGX Fiber Module**
HD-15 TX →	SC Optical →	DVI →	Not Applicable
DVI TX →	SC Optical →	DVI →	Not Applicable
Not Applicable	DVI →	SC Optical →	HD-15 RX
Not Applicable	DVI →	SC Optical →	DVI RX
HD-15 TX →	SC Optical →	SC Optical →	HD-15 RX
HD-15 TX →	SC Optical →	SC Optical →	DVI RX
DVI TX →	SC Optical →	SC Optical →	HD-15 RX
DVI TX →	SC Optical →	SC Optical →	DVI RX

A typical system setup is illustrated on page 49 and shows an Epica DGX 32 with DGX SC Optical Boards used in conjunction with DGX TX and DGX RX modules.

The DGX HD-15 TX and the DGX DVI TX modules can be installed interchangeably. The DGX HD-15 RX and the DGX DVI RX modules are interchangeable as well, providing for an extremely flexible system. For example, in the same system, a source device can send a DVI signal and the destination device(s) can receive an RGBHV signal.

Note: *In addition to the system setup options listed in the table above, optical signal flow between Epica DGX 16, 32, and 144 enclosures is supported. Contact your AMX representative for these and other system design possibilities.*

Rack Installation and System Setup

Epica DGX 16 and 32 enclosures can be mounted in a standard EIA 19 in. (48.26 cm) rack.

Required Items for Rack Installation:

- ❑ Enclosure
- ❑ Standard EIA 19 in. (48.26 cm) rack
- ❑ Screwdriver
- ❑ Screws that fit your rack for mounting the enclosure
- ❑ Power cords (2)
- ❑ Surge-protector – highly recommended

Optional Items for Rack Installation:

- ❑ A PC or laptop computer with a null modem cable for communication with the enclosure via the RS-232 serial (Control) port

Installation Recommendations:

- ❑ Write the serial number (normally located on rear of enclosure) in an easily accessible location before installing the enclosure in a rack.
- ❑ Use an earth-grounded power cord / system with an Epica DGX 16 or 32.
- ❑ Attach all power cords to a single surge protector and/or an AC line conditioner.
- ❑ Apply power to the Epica DGX 16 or 32 enclosure before applying power to its source and destination devices.

Safety Recommendations for Laser Products

Important: *No user serviceable parts are included inside an AMX AutoPatch product; service should only be done by qualified personnel.*

Caution - *Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.*

Exercise caution when installing DGX products to avoid direct eye exposure to invisible laser radiation. Follow the recommendations below whenever installing or working with DGX products.

- ❑ Be sure to apply the power only after all the fiber connections are made and no fiber ends are exposed.
- ❑ Do not remove dust plugs from SC fiber connectors or the dust caps from the fiber cables until establishing connections; avoid direct eye exposure.
- ❑ Make sure all cables, including fiber cables, are correctly connected and/or terminated.
- ❑ Before you unplug a fiber cable on an input board, disconnect the power on the DGX TX that is connected to the input.
- ❑ Before you unplug a fiber cable on an output board, disconnect the switch for that output connector.

Installation Procedure

A flow chart showing the installation sequence is in FIG. 9. The procedure, which follows, provides general steps with references to detailed information found in later sections of the manual.

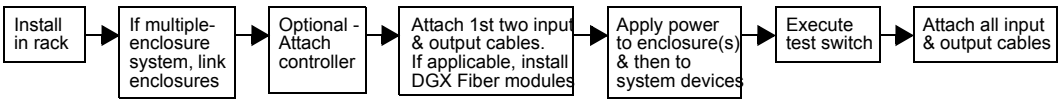

Install in rack
If multiple-enclosure system, link enclosures
Optional - Attach controller
Attach 1st two input & output cables. If applicable, install DGX Fiber modules
Apply power to enclosure(s) & then to system devices
Execute test switch
Attach all input & output cables

FIG. 9 Flow chart for installation procedure

Caution: *To prevent overheating and airflow restriction, avoid placing high heat producing equipment directly above or below the enclosure. The system requires a minimum of one empty rack unit above and below (three empty rack units are recommended). Verify that the openings on the top and sides of the enclosure are not blocked and do not have restricted air flow.*

Note: *If desired, remove rubber feet from bottom of enclosure before rack installation.*

To install and setup an Epica DGX 16 or 32:

Important: *Installation of the Epica DGX 32 requires a minimum of two people; we recommend using three people.*

1. Select a position in the rack for the enclosure that is accessible and does not restrict airflow (see Caution above).
2. Position the enclosure in the rack. Screw in the rack ear screws on each side.

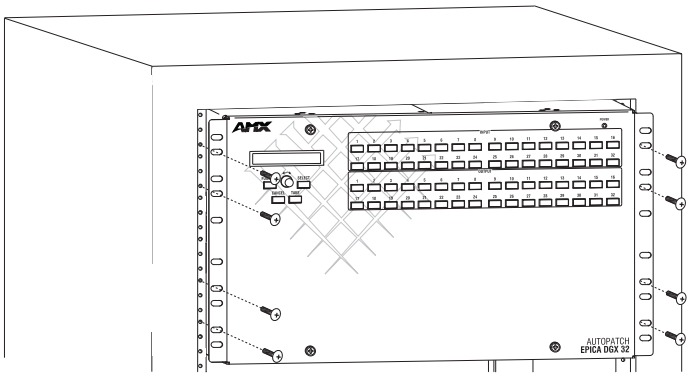


FIG. 10 Rack mounting screws aligned with rack

3. If applicable – For multiple-enclosure systems, link them according to the instructions provided (see page 24).

Caution: *On systems with SC fiber connectors, we recommend using the provided cable management bars or some other type of cable management system to avoid damage to the fiber cables.*

4. Recommended for DGX SC Optical Boards – Attach the provided cable management bars to the input and output boards (see page 23).
5. Attach *only* the first two source and destination devices (see page 35).
6. If applicable – Systems with DGX SC Optical Input and/or Output Boards require DGX Fiber modules. Install the modules for the first two source and/or destination devices (see "System Setup with DGX Modules" on page 49 and the module's documentation).
7. Attach power cords to both power receptacles on each enclosure, then turn on the entire system (see page 36).
   We recommend using a surge protector and/or an AC line conditioner.
8. Execute a test switch to make sure the system is working properly (see page 40).
9. When the test switch works correctly, attach the remaining source and destination devices and any additional DGX Fiber modules.
10. If applicable – Use the EDID Programmer.*

* EDID Programmer software can be used for re-programming the DGX DVI Input Boards if necessary (see page 109). This software is located on the *AMX AutoPatch CD* (also available at **www.amx.com**).

Additional Setup

Additional setup tasks may include the following:.

- Establishing external control – See page 29.
- Establishing an NXB-AP-1000 connection (via the TCP/IP port) – See page 42.
- Setting the Control Panel password – See page 76 in the "Control Panel Operation" chapter.
- Defining local presets – See page 122 in "Appendix B – Managing Configuration Files."
- Defining global presets – See page 65 in the "Control Panel Operation" chapter.

Attaching Cable Management Bars

AMX AutoPatch cable management bars are provided for DGX SC Optical Input and Output Boards.

Caution: *Do not severely bend or kink the SC fiber cable. Irreversible damage can occur. Refer to the physical limitations (bend radius) specified for the cable by the manufacturer. The bend radius for AMX SC terminated fiber cables is 2 inches (5 cm).*

To install cable management bars:

1. **Epica DGX 32 only** – Loosen the two captive screws that hold the connector numbering plate at the top of the connectors. Remove the connector numbering plate and set aside.

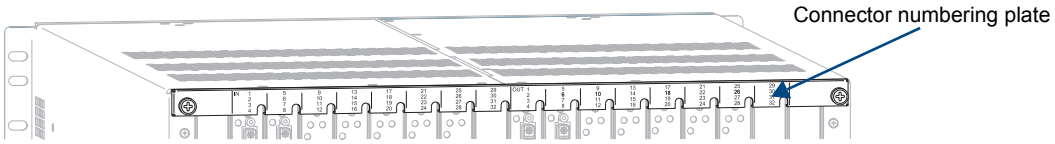
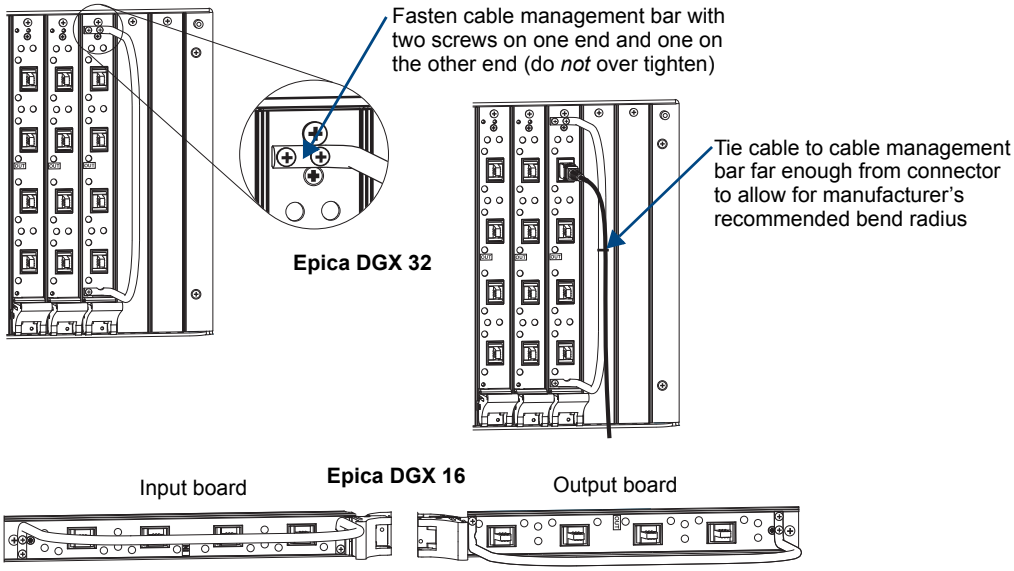


FIG. 11 Connector numbering plate

2. Align the two screw holes on the end of the cable management bar with the two screw holes on the end of the board as shown in FIG. 12. (Note the position of the long part of the bar in relation to the screw holes.)


Fasten cable management bar with two screws on one end and one on the other end (do *not* over tighten)
Tie cable to cable management bar far enough from connector to allow for manufacturer's recommended bend radius
Epica DGX 32
Epica DGX 16
Input board
Output board

Note: On the Epica DGX 16, the orientation of the cable management bar is reversed from the input to the output board.

FIG. 12 Installation of cable management bars (Epica DGX 32 top and Epica DGX 16 bottom)

3. Insert and tighten the two screws at the end of the cable management bar (do *not* over tighten the screws).
4. Align, insert, and tighten the single screw at the other end of the cable management bar (do *not* over tighten).
5. Tie the cable to the cable management bar far enough from the connector to allow for the manufacturer's recommended bend radius. The bend radius for AMX SC terminated fiber cables is 2 inches (5 cm).
6. **Epica DGX 32 only** – Replace the connector numbering plate that was removed in Step 1.

Linking Enclosures

Epica DGX 16 and 32 enclosures can link to each other or to most other types of AMX AutoPatch Distribution Matrices (see the tables below).

Important: *The shipping boxes each have a bright yellow/green sticker that states that the unit (enclosure) is part of a multiple-enclosure system and must be installed with the same serial numbers.*

The Epica DGX 16 and 32 enclosures use two Ethernet (10/Base-T) ports on their CPUs to link to other enclosures. These ports are labeled Enc Link. Do *not* use the port labeled TCP/IP for linking enclosures.

Linking enclosures allows control information to pass between them. In a multiple-enclosure system, the enclosure with a control panel or with an external controller attached receives control information and passes on relevant information to the other enclosures via the links, as well as retrieving a control request for success/failure from each of them.

Caution: *AMX AutoPatch systems should only be linked in their own isolated networks.*

If any of the linked enclosures were not part of the original system, contact technical support (see page 42) for important information not included here.

Enclosures and Ethernet Connectors

The method used for linking depends on the type of Ethernet connector on each enclosure's CPU. The table below indicates the type of Ethernet connectors available on AMX AutoPatch enclosures.

Enclosure	Ethernet 10Base-T (RJ-45*)	Ethernet 10Base-2 (BNC)
Epica DGX 16 and 32	●	
Epica DG and Epica DGX 144	●	
Epica-128 and Epica-256		●
Modula and Modula CatPro		●
Optima and Optima SD	●	
Precis SD	●	

* The RJ-45 port is labeled "Enc Link."

Link Cables and Equipment

AMX provides link cables and equipment for enclosures that are ordered as part of a linked system. Epica DGX 16 and 32 enclosures can link to each other or to other AMX AutoPatch Distribution Matrices using the cable and equipment specified in the table below. A Multi-Port (8 or 5) Switch is also provided for some types of multiple-enclosure systems.

Note: *Either RJ-45 crossover cable (provided) or RJ-45 straight-through patch cable can be used because the Enc Link ports on the Epica DGX 16 and 32 enclosures automatically adjust to either type of cable.*

Link Cable and Equipment for Epica DGX 16 and 32 Linked Systems				
Enclosure →	Cable →	Converter →	Cable →	Enclosure
Epica DGX 16 or 32	RJ-45	–	–	Epica DGX 16 or 32
Epica DGX 16 or 32	RJ-45	–	–	Epica DG or Epica DGX 144
Epica DGX 16 or 32	RJ-45	Media Converter	RG-58 coax	Epica-128 or Epica-256
Epica DGX 16 or 32	RJ-45	Media Converter	RG-58 coax	Modula or Modula CatPro
Epica DGX 16 or 32	RJ-45	–	–	Optima or Optima SD
Epica DGX 16 or 32	RJ-45	–	–	Precis SD

Link Cables and Equipment List

- **RJ-45 Crossover Cable:** use for direct linking between two or more Epica DGX 16 or 32 enclosures or between an Epica DGX 16 or 32 and any other 10Base-T enclosure; also used to connect 10Base-T (RJ-45) enclosures to a Media Converter or to a Multi-Port Switch. The cable is wired to TIA/EIA-568-A on one end and TIA/EIA-568-B on the other end.
- **RG-58 Coax Cable:** use to connect a 10Base-2 (BNC) enclosure to a Media Converter (also used to daisy chain 10Base-2 enclosures).
- **Media Converter:** use when linking a 10Base-T (RJ-45) enclosure to a 10Base-2 (BNC) enclosure.
- **Multi-Port Switch:** use when linking some types of multiple-enclosure systems.

Note: *RJ-45 straight-through patch cable can also be used for direct linking between 10Base-T enclosures or to connect a 10Base-T (RJ-45) enclosure to a Media Converter or to a Multi-Port Switch. Both ends of the cable are wired to TIA/EIA-568-A.*

Ethernet Connector LEDs

The Enc Link, 10Base-T Ethernet (RJ-45), connectors on the Epica DGX 16 and 32 have two LEDs that indicate communication status when the enclosure is linked to an active system.

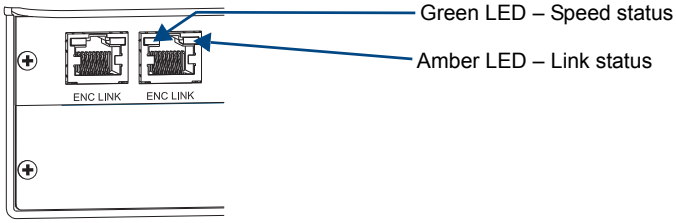


FIG. 13 LEDs on Enc Link connectors

The LEDs indicate the following:

- Green LED *on* – speed status is 100 Mbps
- Green LED *off* – speed status is 10 Mbps
- Amber LED *on* – link status is active

Linking Epica DGX 16 or 32 to Enclosure with RJ-45 Link Connector

An Epica DGX 16 or 32 can be directly linked to another Epica DGX 16 or 32, an Epica DGX 144, Epica DG, Optima, Optima SD, or to a Precis SD enclosure via their 10Base-T Ethernet ports using an RJ-45 cable.

Cable Length Requirements

Network Segment	Cable Type	Maximum Distance
Epica DGX 16 or 32 to Epica DGX 16 or 32, Epica DGX 144, Epica DG, Optima, Optima SD, or Precis SD	RJ-45	100 ft. (30.5 m)

To link an Epica DGX 16 or 32 to an enclosure with an RJ-45 link connector:

1. Insert the connector on one end of the RJ-45 cable into the Epica DGX 16 or 32 enclosure's Enc Link (RJ-45) port.

2. Insert the connector on the other end of the RJ-45 cable into the Enc Link (RJ-45) port on the second enclosure (FIG. 14).

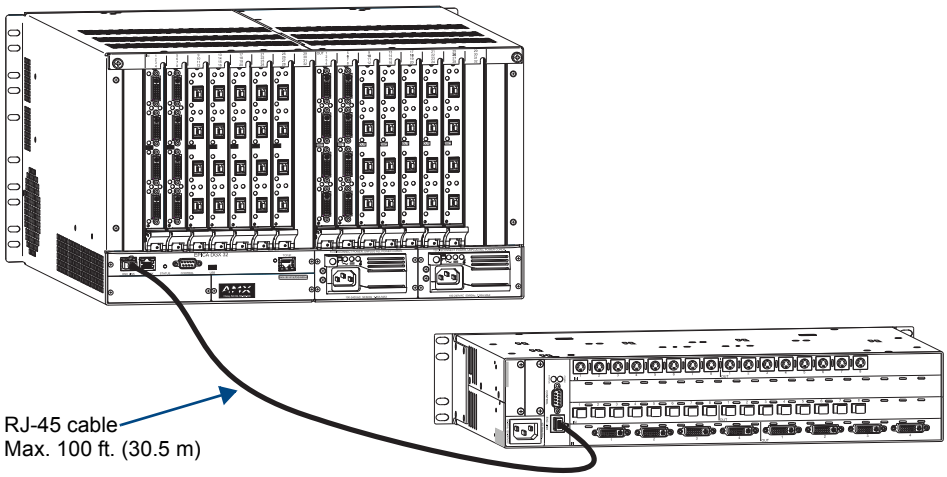


FIG. 14 Epica DGX 32 linked to an Optima using RJ-45 cable

When power is applied, the Ethernet connector LEDs illuminate indicating communication status (see above).

Linking Epica DGX 16 or 32 to Enclosure with BNC Link (Also BNC Daisy Chain)

An Epica DGX 16 or 32 enclosure can be linked to an enclosure with an Ethernet 10Base-2 (BNC) connector (Modula, Modula CatPro, Epica-128, or Epica-256) by using a Media Converter, RJ-45 cable, and RG-58 coax cable. Additional 10Base-2 enclosures can be daisy-chained off the first enclosure.

Cable Length Requirements

Network Segment	Cable Type	Maximum Distance
Epica DGX 16 or 32 to Media Converter	RJ-45 (crossover provided)	100 ft. (30.5 m)
Media Converter to last enclosure in daisy chain	RG-58 coax	10 ft. (3.05 m) total

Important: *Attach 50-ohm termination connectors to the open ends of the T-connectors on the Media Converter and on the last enclosure of the cable run.*

To link an Epica DGX 16 or 32 to an enclosure with a BNC link connector:

1. Insert the RJ-45 cable into the Epica DGX 16 or 32 enclosure's Enc Link (RJ-45) port.
2. Insert the other end of the cable into the Media Converter's 10/100 (RJ-45) port.
3. Fasten a T-connector to the Media Converter's BNC connector.
4. Attach an RG-58 coax cable to the T-connector.
5. Add a 50-ohm termination connector to the open end of the T-connector.
6. Fasten a T-connector to the Ethernet 10Base-2 / BNC link connector on the second enclosure's CPU.
7. Attach the open end of the RG-58 coax cable to the T-connector.
8. If applicable – Attach additional enclosures with T-connectors and RG-58 coax cables.

9. Add a 50-ohm termination connector to the open end of the T-connector on the last enclosure of the cable run.

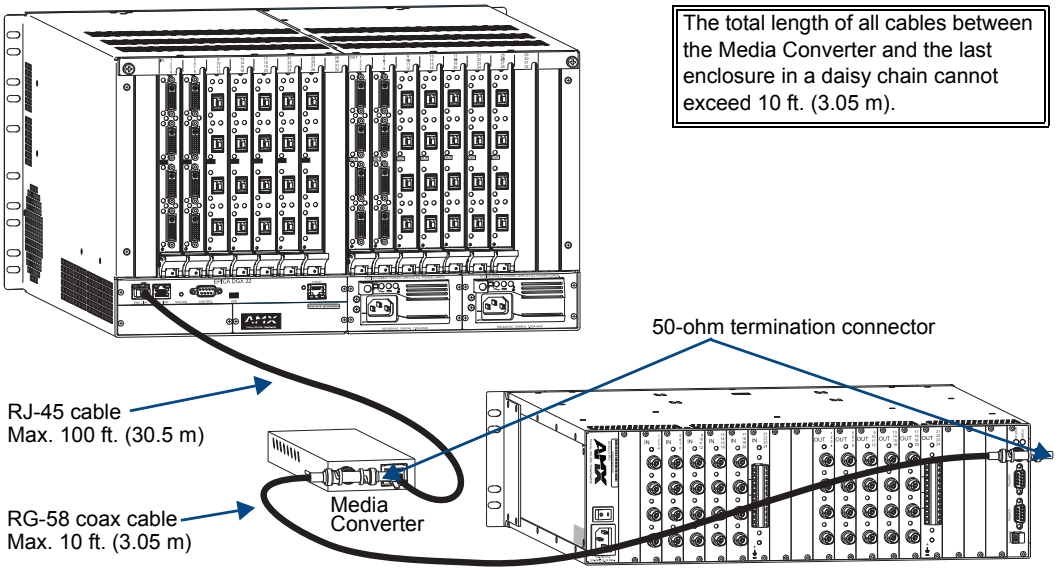

The total length of all cables between the Media Converter and the last enclosure in a daisy chain cannot exceed 10 ft. (3.05 m).
50-ohm termination connector
RJ-45 cable
Max. 100 ft. (30.5 m)
RG-58 coax cable
Max. 10 ft. (3.05 m)
Media
Converter

FIG. 15 Epica DGX 32 linked to a Modula using a Media Converter

When power is applied, the Ethernet connector LEDs illuminate (see page 25).

Linking Multiple Enclosures

Linking an Epica DGX 16 or 32 enclosure to multiple enclosures with BNC connectors is done in a daisy chain (see the instructions on the previous page and daisy chain off the T-connector).

Linking an Epica DGX 16 or 32 enclosure to more than two enclosures with RJ-45 link connectors requires a Multi-Port Switch and RJ-45 cables (see "Cable Length Requirements" table and instructions below).

Linking an Epica DGX 16 or 32 enclosure to enclosures with different types of link connectors requires a Multi-Port Switch, RJ-45 cables (check "Cable Length Requirements" table below), a Media converter, and RG-58 coax cable (see instructions below and on the next page). If this type of system has multiple 10Base-2 (BNC) enclosures, only one enclosure needs to be attached to the Multi-Port Switch with a Media Converter. The rest of the enclosures can be daisy-chained off the T-connector.

Cable Length Requirements

Network Segment	Cable Type	Maximum Distance
Epica DGX 16 or 32 to Multi-Port Switch	RJ-45 (crossover provided)	100 ft. (30.5 m)
Multi-Port Switch directly to another type enclosure	RJ-45 straight-through patch	100 ft. (30.5 m)
Multi-Port Switch to Media Converter	RJ-45 straight-through patch	100 ft. (30.5 m)
Media Converter to last enclosure in daisy chain	RG-58 coax	10 ft. (3.05 m) total

Note: *If you have questions regarding cabling or network related issues in conjunction with using a Multi-Port Switch (or hub) for linking enclosures, contact your network administrator.*

To link an Epica DGX 16 or 32 enclosure to a Multi-Port Switch:

1. Insert one end of the RJ-45 cable into an Enc Link (RJ-45) Ethernet port on the Epica DGX 16 or 32 enclosure.

2. Insert the open end of the RJ-45 cable into the Multi-Port Switch.
3. Repeat Steps 1 and 2 using RJ-45 straight-through patch cable for other types of enclosures with 10Base-T (RJ-45) ports.* Go to page 28 for enclosures with 10Base-2 (BNC) ports.

* Applies when linking an Epica DGX 144, Epica DG, Optima, Optima SD, or a Precis SD to a Multi-Port Switch.

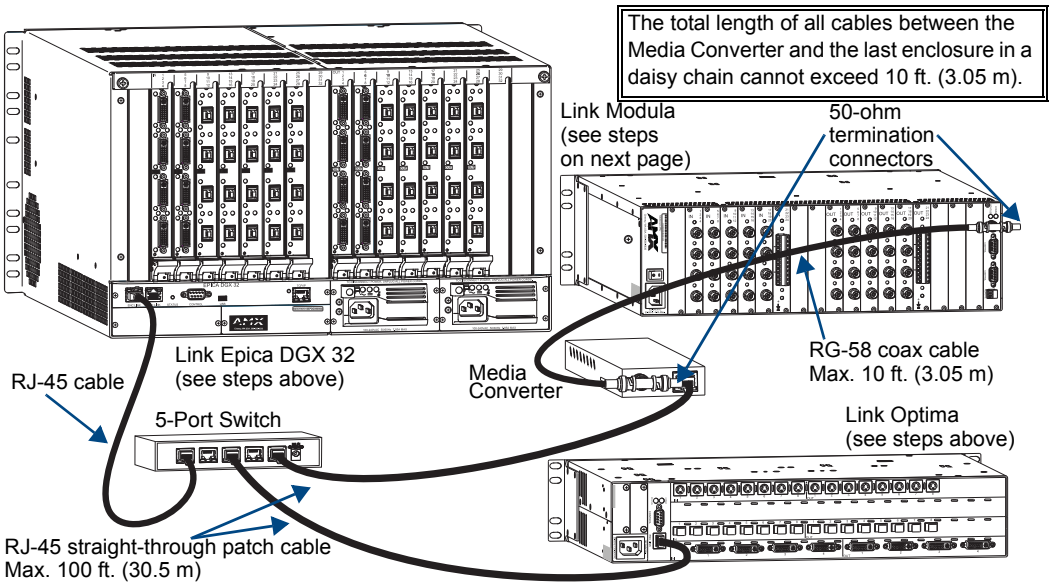

The total length of all cables between the Media Converter and the last enclosure in a daisy chain cannot exceed 10 ft. (3.05 m).
Link Modula (see steps on next page)
50-ohm termination connectors
Link Epica DGX 32 (see steps above)
RJ-45 cable
Media Converter
RG-58 coax cable Max. 10 ft. (3.05 m)
5-Port Switch
Link Optima (see steps above)
RJ-45 straight-through patch cable Max. 100 ft. (30.5 m)

FIG. 16 Epica DGX 32 enclosure linked to an Optima and a Modula

Important: *Attach 50-ohm termination connectors to the open ends of the T-connectors on the Media Converter and on the last enclosure on the cable run.*

To link an enclosure* with a BNC link connector to Multi-Port Switch:

1. Fasten a T-connector to the Ethernet BNC link connector on the enclosure's CPU.
2. Attach an RG-58 coax cable to the T-connector.
3. If applicable – Attach additional enclosures with T-connectors and RG-58 coax cables.**
4. Add a 50-ohm termination connector to the open end of the T-connector on the last enclosure of the cable run.
5. Fasten a T-connector to the Media Converter's BNC connector.
6. Attach the open end of the RG-58 coax cable to the T-connector on the Media Converter.
7. Add a 50-ohm termination connector to the open end of the T-connector on the Media Converter.
8. Insert one end of the RJ-45 straight-through patch cable into the 10/100 (RJ-45) Ethernet port on the Media Converter.
9. Insert the open end of the RJ-45 straight-through patch cable into the Multi-Port Switch.

When power is applied to the enclosures, the Ethernet connector LEDs illuminate indicating communication status (see page 25).

* Applies to Modula, Modula CatPro, Epica-128, and Epica-256 enclosures.

** The total length of all RG-58 coax cables between the Media Converter and the last enclosure in the daisy chain cannot exceed 10 ft. (3.05 m).

Attaching External Controllers

Epica DGX 16 and 32 enclosures can be controlled externally by attaching a control device that uses one of the communication protocols listed below:

- BCS (Serial) – ASCII sent over a null modem serial cable via the serial port
- BCS (USB) – ASCII sent over a USB cable via the USB (mini-B) port
- XNNet – AMX AutoPatch protocol via the serial port
- TCP/IP – TCP/IP sent over an RJ-45 cable via the TCP/IP port for establishing an NXB-AP-1000 connection to a LAN

Important: *The Enc Link (RJ-45 Ethernet) port is not a TCP/IP connection. It is used only for linking enclosures (see page 24).*

Control Options

The communication protocols listed above are used for these control options:

AMX Control Devices

The Epica DGX 16 and 32 are compatible with a number of AMX control devices via Native NetLinx communication. For control programming information, see the instruction manual for the specific interface.

APControl 3.0

APControl 3.0 software (for control and scheduling) runs on a PC connected to an Epica DGX 16 or 32 via the serial port (DB-9) or the USB (mini-B) port and is available on the *AMX AutoPatch CD*. APControl 3.0 has a setup wizard for manually configuring the VMs (virtual matrices) to control.

NXB-AP-1000 Interface

The NXB-AP-1000 interface runs on the NXB-AP-1000 connection (the PC is connected to the TCP/IP port on the CPU). The server delivers HTML pages for setting up the system and a Java control applet, which allows for remote control of an AMX AutoPatch Routing System using PC-based Internet browsing software.

XNNet Protocol (Serial)

Advanced programmers who want to design their own control programs can use AMX AutoPatch XNNet protocol. The *AMX AutoPatch CD* includes the XNNet Communication Library, an interface library that supports C, Java, and Visual Basic with examples of the XNNet protocol in use.

BCS (Serial) Control

AMX AutoPatch has developed a command language, BCS (Basic Control Structure), for executing control operations and for diagnostic purposes. BCS commands are issued via a terminal emulation program (e.g., as Windows® HyperTerminal). For information on BCS commands, see the *Instruction Manual – BCS Basic Control Structure Protocol* on the *AMX AutoPatch CD* or at **www.amx.com**.

Third-Party Controllers (Serial)

Third-party controllers connect to the serial port (DB-9) or USB (mini-B) port on the CPU. If using a third-party controller, see the controller documentation for setup and operating instructions.

Connecting Serial Controllers

An external serial controller is any device that can send and receive ASCII code over an RS-232 (null modem) serial cable attached to the serial port (DB-9) on the enclosure's CPU. (The USB port can also be used by creating a virtual Com port; see page 32.) PCs are common serial controllers. Once a PC is attached to the Epica DGX 16 or 32, the system can be controlled by running APControl software on the attached PC (see the *AMX AutoPatch CD*). The system can also be controlled by entering BCS commands into a terminal emulation program (e.g., HyperTerminal). For USB serial control information, see page 32.

PC Requirements for APControl 3.0

- ❑ Windows XP Professional® or Windows 2000®
- ❑ Java Runtime Environment (JRE): v1.4.2 or the latest version
- ❑ Minimum Hardware: 166 MHz, 128 MB RAM, 20 MB free disk space, 800x600 display
- ❑ Recommended Hardware: 2.0 GHz, 512 MB RAM, 20 MB free disk space, 1280x1024 display
- ❑ Serial port or USB port

PC Requirements for BCS

- ❑ Windows XP Professional® or Windows 2000®
- ❑ Terminal emulation program
- ❑ Serial port or USB port

Connecting Serial Controller to DB-9 Port

The RS-232 cable pinout is in FIG. 18 on page 31.

To establish external serial control:

1. Plug one end of the null modem serial cable into the Control port (DB-9) on the enclosure (FIG. 17).

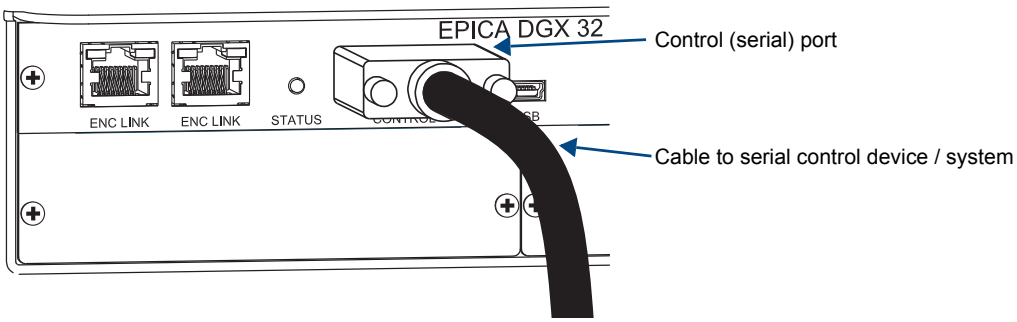


FIG. 17 Null modem serial cable connected to Control port

2. Plug the other end of the serial cable into the serial port on the serial controller.
3. If not already on, apply power first to the Epica DGX 16 or 32 enclosure and then to the source and destination devices (see "Applying Power and Startup" on page 36).

Caution: *To avoid system damage, follow the power-up sequence on page 37. We recommend attaching all power cords to a surge protector and/or AC line conditioner.*

4. Setup and run the desired method of control:
   - AMX Controller – For control programming information, see the instruction manual for the specific interface
   - APControl 3.0 – Install and open the program (located on the *AMX AutoPatch CD*). Follow the setup wizard. Manually create the VM (virtual matrix) and specify the number of inputs and outputs. Open the APControl Launchbar. From the Launchbar menu, select Views / CrossBar and click the crosspoints to execute switches.and click the crosspoints.
   - Terminal emulation (e.g., HyperTerminal) – Open the program (typically at start/Programs/Accessories/Communications/HyperTerminal), select the Com port, and set the settings to match the default ones in the Epica DGX 16 and 32 Serial Port Settings table to the right. Click OK. A short splash screen appears.
5. Execute a test switch to make sure the system is working properly (see page 40).

Epica DGX 16 and 32 Serial Port Settings	
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

Serial Communication Settings

When controlling the system with a serial controller, use serial communication software and make sure the baud rate is set correctly for the system. The recommended settings (default settings) for serial communication with Epica DGX 16 and 32 Distribution Matrices are provided in the table above. Epica DGX 16 and 32 enclosures support baud rates of 9600 (default), 19200, 38400, and 57600. The settings on the PC serial communication software and the enclosure *must* correspond to each other. If a change is required to make them match, changing the PC's settings is preferable. If you decide to change the enclosure's settings instead, use XNConnect (see the Help file).

RS-232 Pin Diagram

Use a null modem cable that matches the pin diagram in FIG. 18 for RS-232 without hardware flow control. AMX AutoPatch equipment requires pins 2, 3, and 5 only.

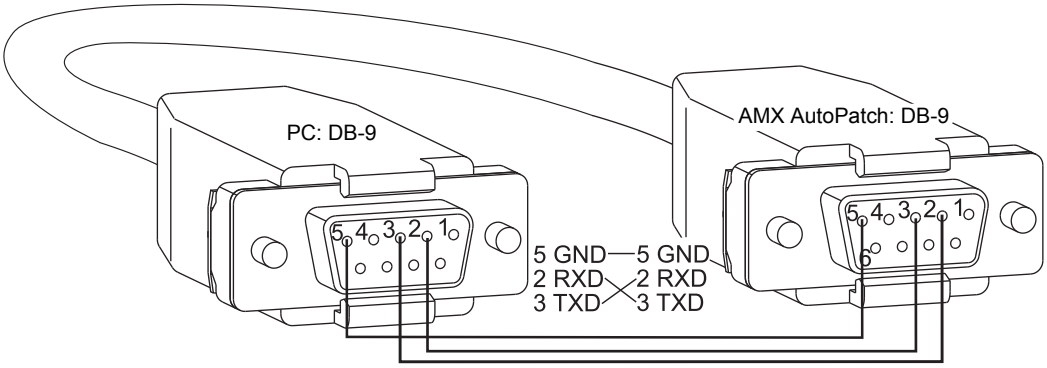


FIG. 18 RS-232 null modem cable pin diagram, no hardware flow control

Connecting Serial Controller to USB Port

Controlling an Epica DGX 16 or 32 using a USB connection requires the creation of a virtual Com port. Once created, the virtual Com port is used as if it were a standard serial connection and can connect to a control application (such as, APControl 3.0) or to a terminal emulation program (e.g., Windows® HyperTerminal) for BCS control.

Important: *You must have adequate rights to install USB device drivers to the PC. Check with your System Administrator to be sure you have the required access.*

When establishing a new connection, complete all of the steps in the instructions starting below.

Or

When reconnecting after previously establishing a USB connection, complete Steps 1 and 2 and then set up and run the desired software program or utility.

The following steps apply when you use the *AMX AutoPatch CD* that shipped with the system. Using the default selections, the Found New Hardware Wizard searches and installs the software.

Note: *If for any reason the Wizard does not automatically install the software, APBridge.inf is located on the AMX AutoPatch CD (<CDDrive>:\Configuration\APConfig\USB) and at* ***www.amx.com*** *(enter APBridge.inf in the Search AMX.com field in the upper right-hand corner of the site).*

To attach a PC to the USB (mini-B) port and establish a virtual Com port:

1. Apply power to the enclosure (see page 36).
2. Connect the enclosure to a PC running Windows using the USB cable provided by AMX (FIG. 19).

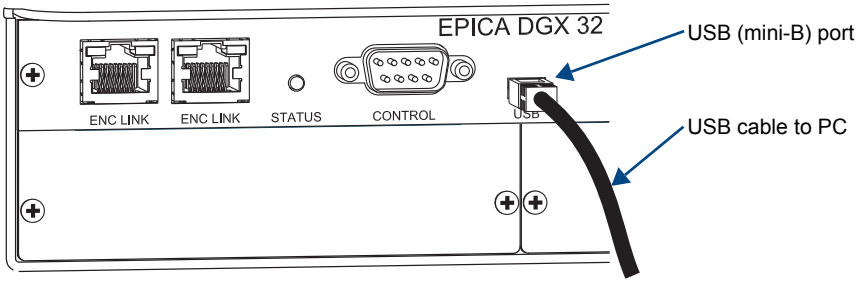
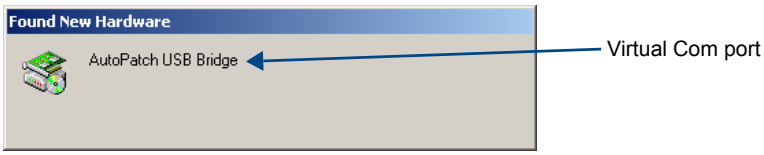


FIG. 19 USB cable connected to USB port on Epica DGX 32 and to PC

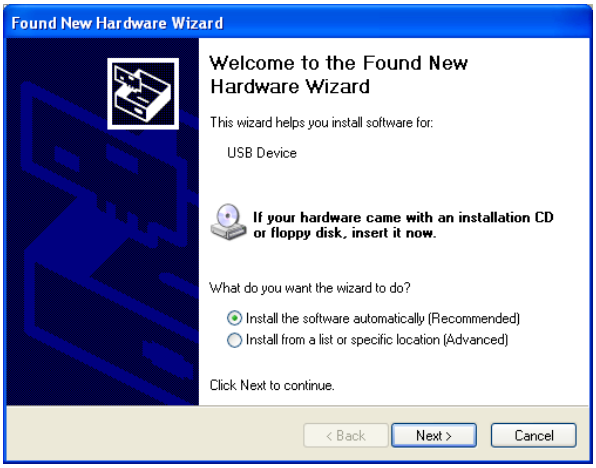
3. If establishing a new connection, complete the remaining steps.
   Or
   If reconnecting after previously establishing a USB connection, go to Step 5 of the procedure for identifying the virtual Com port on page 34 to run the desired software.

Note: *The following dialog boxes appear only during the initial USB connection. Once the virtual Com port has been assigned to the enclosure, the dialog boxes do not appear again. If they do appear, you have connected the USB plug to a different Com port than the initial one – either switch to the initial Com port or establish a virtual Com port for the new port on the PC.*

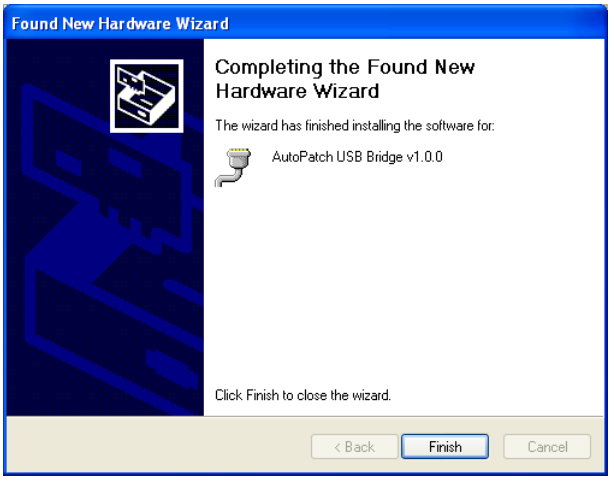
The Found New Hardware notice window appears briefly. The Hardware Wizard will refer to the virtual Com port used by the Epica DGX 16 or 32 as an “AutoPatch USB Bridge” or “USB Device.”



The Found New Hardware Wizard opens with the default selected to automatically install the software. (The dialog boxes may differ slightly from those shown, depending on the operating system for the PC.)


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
USB Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

4. Insert the *AMX AutoPatch CD* into the PC's CD holder.
5. Click Next.
6. Click Finish when prompted to close the wizard.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
AutoPatch USB Bridge v1.0.0
Click Finish to close the wizard.
< Back
Finish
Cancel

Identifying the Virtual Com Port

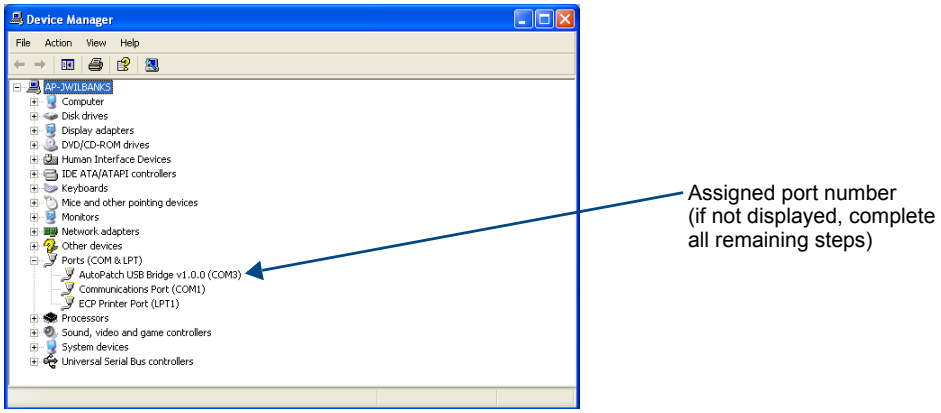
You *must* identify the virtual Com port assigned to the USB connector to enable communication between the control PC and an Epica DGX 16 or 32.

The enclosure *must* be connected to the PC via the USB port and powered up before you start the following procedure, so the PC can display the port number.

To identify the virtual Com port:

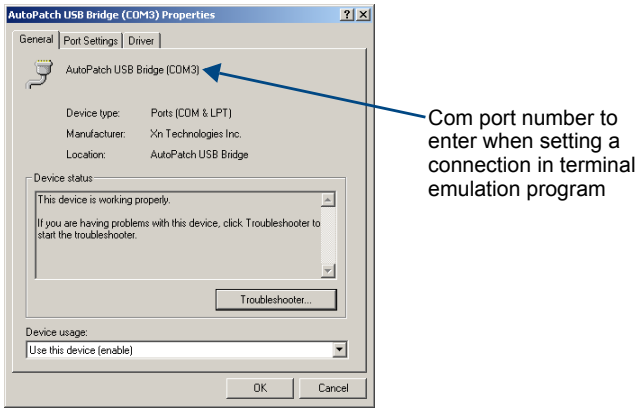
1. Open the Windows Device Manager (Start/Settings/Control Panel/System/System Properties/ Hardware tab/Device Manager button) and expand Ports by clicking on the "+".
   (The Device Manager may have a different location depending on the operating system and theme selected.)

2. If the port specifies the Com number, go to Step 4.
   If the port does not specify the Com number, right-click AutoPatch USB Bridge and select Properties and complete all remaining steps.



3. In the AutoPatch USB Bridge Properties dialog box, select the General tab.

4. *Make note of the Com port assigned to the AutoPatch USB Bridge.* This port number *must* be entered when setting a connection in a software program or terminal emulation program. The PC will always associate a specific USB connector with the assigned virtual Com port. The PC will not recognize the Epica DGX 16 or 32 if you disconnect and reconnect using a different Com port on the PC. However, it will attempt to install a new virtual Com port using the new port. If completed, the new port will be assigned a different Com number.



5. Set up and run the desired application:

   - **AMX Controller** – For control programming information, see the instruction manual for the specific interface.
   - **APControl 3.0** – Install and open the program (located on the *AMX AutoPatch CD*). Follow the setup wizard. Manually create the VM (virtual matrix) and specify the number of inputs and outputs. Open the APControl Launchbar. From the Launchbar menu, select Views / CrossBar and click the crosspoints to execute switches.
   - **HyperTerminal** – Open the program (typically at start/ Programs/Accessories/Communications/HyperTerminal). Check to be sure the Communications Port option is set for the port determined in the previous steps. Set the settings to match the default ones in the Serial Port Settings table to the right. Click OK. A short splash screen appears.
   - **XBar (NXB-AP-1000 interface)** – See page 95.

Epica DGX 16 and 32 Serial Port Settings	
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

6. Execute a test switch to make sure the Epica DGX 16 or 32 is working properly (see page 40).

Important: *If power is cycled on the enclosure, the USB connection must be reestablished. Remove the USB cable and close the software application in use. Then reconnect the USB cable to the same USB connector used previously and reopen the communication software.*

Attaching Input and Output Cables

Input and output connectors are the attachment points for source and destination devices that connect to the system. Viewed from the rear of the enclosure, the input boards (for attaching sources) are on the left, and the output boards (for attaching destinations) are on the right.

Epica DGX 16 – Enclosures have 8 horizontal board slots (4 slots each for the input and the output boards, with 4 connectors per board), allowing for a maximum configuration of 16x16 (FIG. 20).

Epica DGX 32 – Enclosures have 16 vertical board slots (8 slots each for the input and the output boards, with 4 connectors per board), allowing for a maximum configuration of 32x32 (FIG. 21).

Connectors and Input and Output Channels

Epica DGX 16 – Input and output channels numbers correspond to the connectors and are located between the input and output boards. For inputs, numbering is consecutive from left to right on each board from the top board to the bottom one; outputs start over at 1 and follow the same pattern.

Epica DGX 32 – Input and output channels numbers correspond to the connectors and are located on the numbering plate (metal strip) directly above the boards. For inputs, numbering is consecutive from top to bottom on each board from the left board to right one; outputs start over at 1 and follow the same pattern

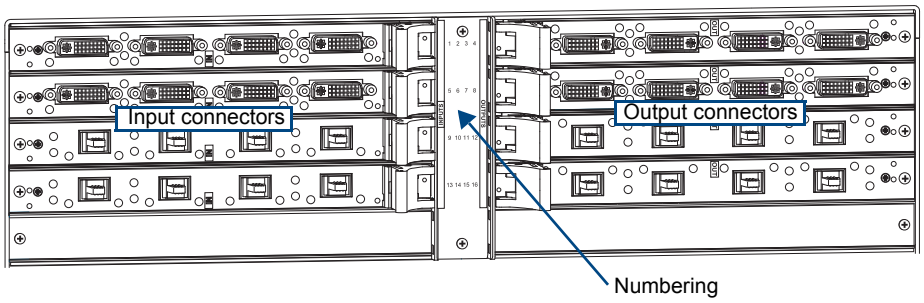


FIG. 20 DGX 16 - Numbering indicates input and output channels

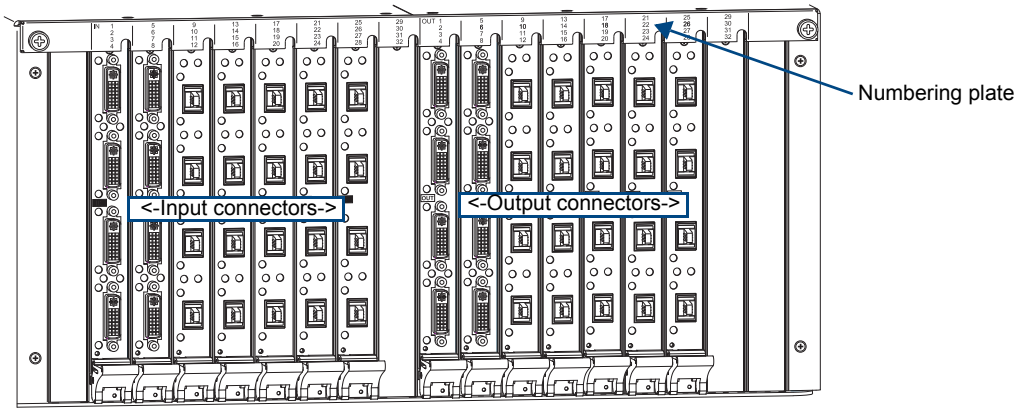


FIG. 21 DGX 32 - Numbers on numbering plate indicate input and output channels

For board connector information and specifications, see the DGX SC Optical Board chapter on page 47 and the DGX DVI Board chapter on page 53.

Input and Output Signal Cables

When attaching input and output signal cables in a multiple-enclosure system, check the system and enclosure numbers are on the rear of the Epica DGX 16 or 32 (if not on the rear, the numbers are on the side). *The system was programmed at the factory to operate only as a specifically configured system.*

If AMX AutoPatch cable management bars are used, they are installed before attaching cables (see page 23).

Before connecting all input and output cables, attach only the first two input and output cables (and any applicable DGX Fiber modules) and execute a test switch (see page 40). When the test switch is successful, attach the rest of the input and output cables.

For information on cabling specific types of connectors, see the DGX SC Optical Board chapter on page 47 or the DGX DVI Board chapter on page 53.

Applying Power and Startup

The enclosures's universal power receptacles will accept all major international standard power sources. (Two US power cords are included with all shipments unless ordered otherwise.) Maximum power specifications are on each power receptacle (also listed on page 14). Always use earth-grounded power cords / system with an Epica DGX 16 or 32.

The source electrical outlet should be installed near the enclosure, easily accessible, and properly grounded. Power should come from a building branch circuit. We strongly recommend using a dedicated line for the system's power. Use a minimum breaker current rating of 20 A for 110 V or 10 A for 230 V. To avoid an overload, note the power consumption rating of all the equipment connected to the circuit breaker before applying power.

Complete Power Redundancy Setup

For proper redundant operations, both power supplies must be powered at all times. To take full advantage of dual power feeds and redundant power supplies on the Epica DGX 16 and 32, we recommend cabling the primary Epica DGX 16 or 32 power feed, via a power strip to an outlet connected to one circuit breaker and the redundant power feed via a power strip to an outlet connected to a second circuit breaker (FIG. 22). For linked systems with redundant power supplies, repeat pattern.

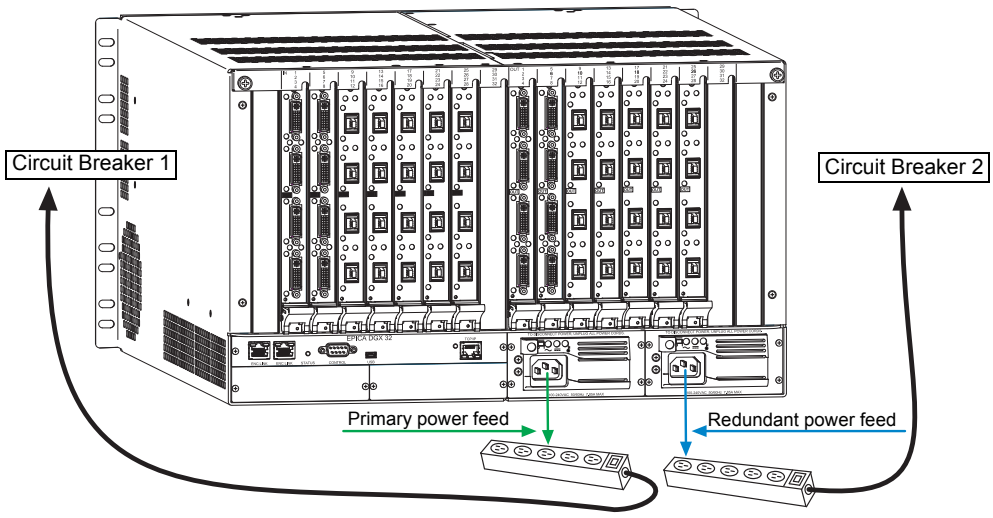


FIG. 22 Power setup for complete redundancy on Epica DGX 32

Caution: *We recommend attaching all power cords to a surge protector and/or an AC line conditioner.*

Power-Up Sequence

Caution: *Each power supply has a small toggle switch to the left of its LEDs that controls internal power and must remain flipped to the right for the system to operate. Do not flip this switch to the left.*

The following instructions start with attaching only two source and destination devices for the purpose of executing a test switch.

To apply power:

1. Attach the first two source and destination devices (if the system contains SC Optical Boards, this step includes installing DGX TX and RX Fiber modules; see the modules' documentation).
   Do *not* apply power to the source and destination devices until Step 7.
2. Optional – Attach an external control device/system (see page 30).
3. Plug power cords into both of the power receptacles on the enclosure (repeat for additional enclosures in multiple-enclosure systems).

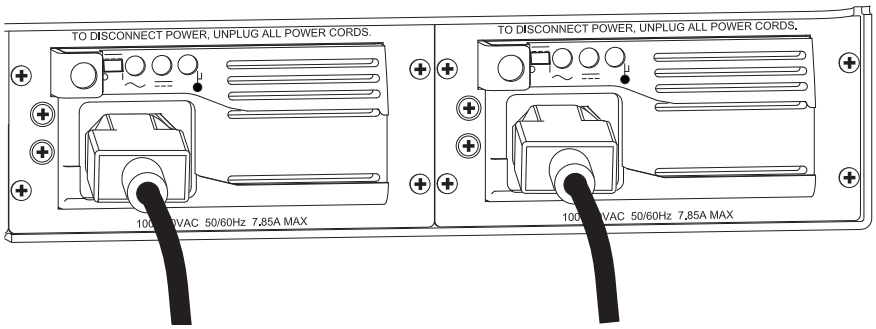


FIG. 23 Attach power cables to both power receptacles

4. Plug the other end of each power cord into a power strip(s) *that is turned off* (we recommend using a 20 A circuit breaker on a 110 circuit for fully loaded enclosures).
5. Turn on the power strip(s) (to all enclosures if applicable) and wait 30 seconds.
   The Power indicator LED on the Control Panel illuminates green (both redundant power supplies are working). If only one power supply is working, the Power indicator will illuminate a constant red (check power connections and switches).
   The LCD on the Control Panel illuminates and displays the menu screen.
6. Optional – Apply power to a control device/system.
7. For systems with SC Optical Boards – Apply power to the DGX TX and RX Fiber modules.
8. Apply power to the source and destination devices.
9. Execute a test switch (see page 40). (For startup information on specific types of control, see page 38 before executing a test switch.)
10. Attach the remaining sources and destinations and apply power to them.

Indicator Lights at Startup

When the enclosure powers up, the indicator LEDs respond as follows:

Epica DGX 16 and 32 LED Indicators

	LED	Indicates	Normal Display	Cautionary
Front	Power	System power	Constant green	Constant red: only one power supply is working
Rear – Power Supply	AC Power (~)	AC power present	Constant green	Not illuminated: AC failure
	DC Power (⎓)	DC power present	Constant green	Not illuminated: DC failure
	Temperature ( )	Power supply temperature	Not illuminated	Amber: power supply is over temperature
Rear – CPU	Enc Link • Green • Amber	See page 25 • Speed status is either 100 Mbps (on) **or** 10 Mbps (off) • Activity between enclosures	• Constant green **or** not illuminated • Blinks amber with activity	
	Status	System status	Constant green during power up, then blinking green at 1 second on/off intervals	Blinking red/green: an exception has been logged in IOS (validation failure) Blinking red: dropped into IOS mode*
	TCP/IP • LED to left • Link/Activity • Speed	See page 42 • Active server connection • Active link status with server • Speed status is either 100 Mbps (on) **or** 10 Mbps (off)	• Blinks green at 5 second intervals (left of RJ-45) • Blinks amber (left on RJ-45) • Constant green **or** not illuminated (right on RJ-45)	

* IOS (Initial Operating System) is the base layer operating system on AMX AutoPatch equipment. IOS performs functions such as hosting higher level run-time software applications. When unexpected critical errors are encountered within such hosted applications, system control of the equipment may be passed to the IOS layer preventing normal system operation until the error is manually cleared. Please report all such errors to AMX AutoPatch technical support (see page 42).

Important: *If the indicator LEDs do not respond with a normal display as stated above, check power connections, before contacting technical support (see page 42).*

Important: *When the system is powered down, be sure the indicator LEDs on the CPU are off and the fans have stopped before reapplying power.*

The system is ready to disconnect the factory default switch and to execute a test switch (see page 40) using the control method of your choice.

TCP/IP Startup for NXB-AP-1000 Connection

If you have not already done so, attach the enclosure to a PC via the TCP/IP port (see page 42).

Serial Control Device Startup

If you have not already done so, attach the serial control device to the enclosure (see page 29) and open the control program.

AMX Control Devices

The Epica DGX 16 and 32 are compatible with a number of AMX control devices. For control programming information, see the instruction manual for the specific interface.

APControl 3.0.1

If you are using APControl 3.0.1, install and open the program. Follow the directions in the setup wizard. Follow the setup wizard. Manually create the VM (virtual matrix) and specify the number of inputs and outputs. Open the APControl Launchbar. From the Launchbar menu, select Views / CrossBar and click on the crosspoints to execute switches.

HyperTerminal

When power is applied to the enclosure, HyperTerminal displays a one-line splash screen followed by "`Ready`" (FIG. 24). The system is ready to disconnect the factory default switch and to execute a test switch (see page 40).

If you need to access advanced system information, see "Appendix D – Programmer's Interface for System Diagnostics" on page 139.

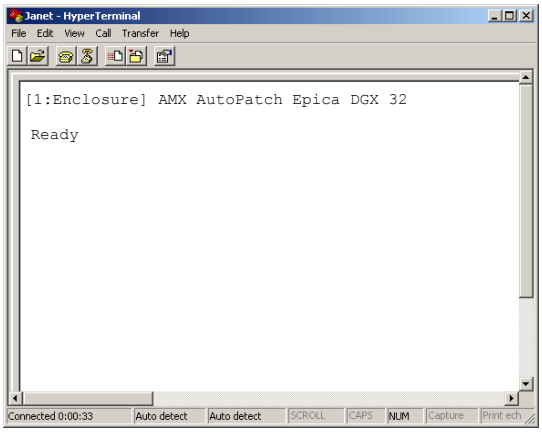


FIG. 24 Power-up splash screen in HyperTerminal (Epica DGX 32 shown)

Note: *AMX reserves the right to add to the contents of the splash screen at any time, without notice.*

Redundant Power Supply (RPS)

Each enclosure ships with two mutually-redundant (hot-swappable) power supplies.

The Power indicator on the front of the enclosure will illuminate a constant red if a problem occurs with one of the power supplies. Check the AC and DC LED indicators on the rear of the enclosure directly above each power receptacle to determine if a power supply is not working.

For additional LED indicator information, see page 38.

Important: *A failed power supply should be replaced as soon as possible to maintain the system's power redundancy. For replacement information, contact technical support (see page 42).*

Power Supply Troubleshooting

If a power supply's AC and DC power indicator LEDs are not illuminated:

- ❑ Check to be sure the power cord is completely plugged into the Epica DGX 16 or 32 and to the power source.

If the AC and DC LEDs remain unilluminated, contact technical support (see page 42).

Caution: *Do not remove a failed power supply until you have the replacement and are ready to install it, unless directed to do so by technical support. Epica DGX 16 and 32 enclosures are able to operate normally with a failed RPS.*

Executing a Test Switch

For new system installations, we recommend executing a test switch to verify the system is working properly before attaching *all* inputs and outputs. Aside from having signal cables and a controller attached, the system is ready to execute switches when it ships from the factory.

Attach the first two source and destination devices to the input and output connectors (for specific board connector information and specifications, see the specific board chapter in this manual). After the devices are connected, power must be applied to the enclosure and then to the devices before executing a test switch.

You can execute a test switch from the following:

- Control Panel
- AMX Controller
- Control software, such as APControl 3.0
- BCS (Basic Control Structure) commands over an external controller
- An external third-party controller

Before executing the test switch, make sure the first two source devices and the first two destination devices are connected to the input and output connectors. Any applicable DGX Fiber modules must also be installed (see the modules' documentation).

When executing a test switch, we suggest routing Input (source) 1 to Output (destination) 2 on the default virtual matrix of VM 0, unless you know the system was ordered with custom VMs.

After the test switch has executed successfully, you may need to adjust the image with the software that is provided on the *AMX AutoPatch CD* (also available at **www.amx.com**).

- EDID Programmer software is used for re-programming DGX DVI Input Boards if necessary (see "Appendix A – EDID Programmer" on page 109).

Control Panel

Directions for executing and disconnecting switches using the Control Panel can be found in the "Control Panel Operation" chapter (see page 61).

NXB-AP-1000 Interface (TCP/IP)

Directions for establishing an NXB-AP-1000 connection for control via the TCP/IP port start on page 42.

AMX Controller

For executing and disconnecting switches using an AMX Controller, see the instruction manual for the specific device.

APControl 3.0

Directions for executing and disconnecting switches using APControl 3.0 are found in its Help file.

BCS Commands

To enter BCS commands, the system must be attached to a serial control device (see page 29, "Attaching External Controllers") running a terminal emulation program (e.g., HyperTerminal). The settings on the PC serial communication software and the enclosure *must* correspond to each other (for setting information, see page 31).

When using HyperTerminal, command characters are entered and sent to the enclosure's CPU (the command characters appear in HyperTerminal when the enclosure responds). When all of the entered characters appear in HyperTerminal, the command has been successfully executed.

Levels in BCS commands are the equivalent of virtual matrices for switching purposes.

The following test switch routes Input 1 to Output 2 on Level 0 (VM 0, the default virtual matrix).

To execute the test switch:

1. Enter the following BCS command line:
   `CL0I1O2T`

When a single "`T`" appears, the system has successfully executed the command. If any other character(s) appears, the command was not successful. Verify that the source signal is present (visible and/or audible) at the destination.

For a complete list of BCS commands and responses, see the *Instruction Manual – BCS Basic Control Structure Protocol* on the *AMX AutoPatch CD* or at **www.amx.com**.

Test Switch Troubleshooting

If the test switch did not execute correctly:

- ❑ Check the power indicator on the front of the enclosure.
  If it is not illuminated, check the power cords at the enclosure and at the power source.
- ❑ Verify the status of the test switch. If status returns as routed correctly, the system established a connection between the specified input and output connectors within the enclosure.
  - **Control panel:** use the Control Dial to scroll to Status. Press the Select Key. Press Output Key 2 (turns white). If Input Key 1 turns white, the test switch is routed.
  - **BCS commands:** enter "`SL0O2T`". If "`SL0O2T(1)`" appears, the test switch is routed.
- ❑ Check all link and signal connections on the rear of the enclosure(s) to make sure everything is physically set up correctly.
- ❑ If applicable, check connections on DGX Fiber modules (also see "Troubleshooting" in the *Instruction Manual – DGX Transmitters & Receivers*).
- ❑ Check all power switches on the source and destination devices to make sure all are turned on.
- ❑ Depending on the board type:
  - Isolate source/destination equipment and cable problems by patching around the router using a cable adapter (FIG. 25) to check the overall signal path.

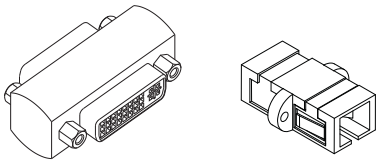


FIG. 25 DVI and SC fiber cable adapters

  - Check the SC fiber connectors to make sure they are fully inserted into the DGX Fiber module and that no dust or debris is on the exposed fiber ends of the cable or on the module.
  - Check the documentation for the DGX Fiber modules to be sure they are installed correctly. Isolate source and destination devices using the DGX Fiber modules to bypass the enclosure to check the fiber cable and overall signal path.
- ❑ Attempt the switch again.
  If the switch still does not work, contact technical support (see page 42).

Technical Support

Before contacting technical support with a question, please consult this manual. If you still have questions, contact your AMX representative or technical support. Have your system's serial number ready (the number is normally located on the rear of the enclosure).

We recommend recording your system's serial number in an easily accessible location.

AMX Contact Information

- 3000 Research Drive, Richardson, TX 75082
- 800.222.0193
- 469.624.8000
- Fax 469.624.7153
- Technical Support 800.932.6993
- www.amx.com

Establishing an NXB-AP-1000 Connection (TCP/IP Port)

The NXB-AP-1000 connection (TCP/IP port) on the CPU provides an interface that allows you to make various configuration settings via a web browser on any PC connected to the same LAN (Local Area Network).

Important: *The Epica DGX 32 uses DHCP by default.*

The NXB-AP-1000 delivers HTML pages for setting up the system and a Java control applet, which allows for remote control of an Epica DGX 16 or 32 using PC-based Internet browsing software.

The enclosure is connected via an RJ-45 link cable to a LAN. The basic directions for the LAN connection follow. For setup details for the NXB-AP-1000 interface, see page 79. For controlling the system through the interface, see page 95.

Important: *Although it is also possible to provide access from outside a LAN via the Internet, security issues for your LAN environment must be taken into account (contact your Network Administrator).*

System Setup for the NXB-AP-1000

Important: *The Epica DGX 32 uses DHCP by default.*

The system setup example below for using the NXB-AP-1000 interface illustrates an Epica DGX 32 Distribution Matrix connected to a LAN. Both computers in the illustration have access to the enclosure, as does the NetLinx Controller.

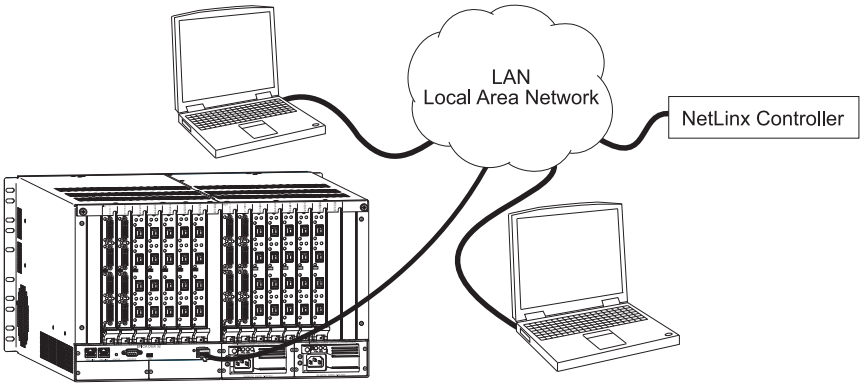


FIG. 26 Epica DGX 32 connected via a LAN to two PCs and a NetLinx Controller

Note: *The NXB-AP-1000 interface can be used to control the system (via the XBar Controller) without establishing a connection to a NetLinx Master; however, it must be connected to a LAN in order to get an IP address from a DHCP server (after the network assigns a DHCP IP address, a static IP address can be assigned in its place).*

Cable Requirements

- ❑ LAN Connection – an RJ-45 link cable (either crossover or straight-through) is required to connect an Epica DGX 16 or 32 enclosure to a LAN.

TCP/IP Port and Indicator LEDs

The TCP/IP port, which provides the NXB-AP-1000 connection, is located on the rear of the enclosure on the right-hand side of the CPU (FIG. 27).

Important: *The Enc Link connectors at the far left of the CPU are to be used only for linking enclosures; do not attempt to use either of them for an NXB-AP-1000 connection.*

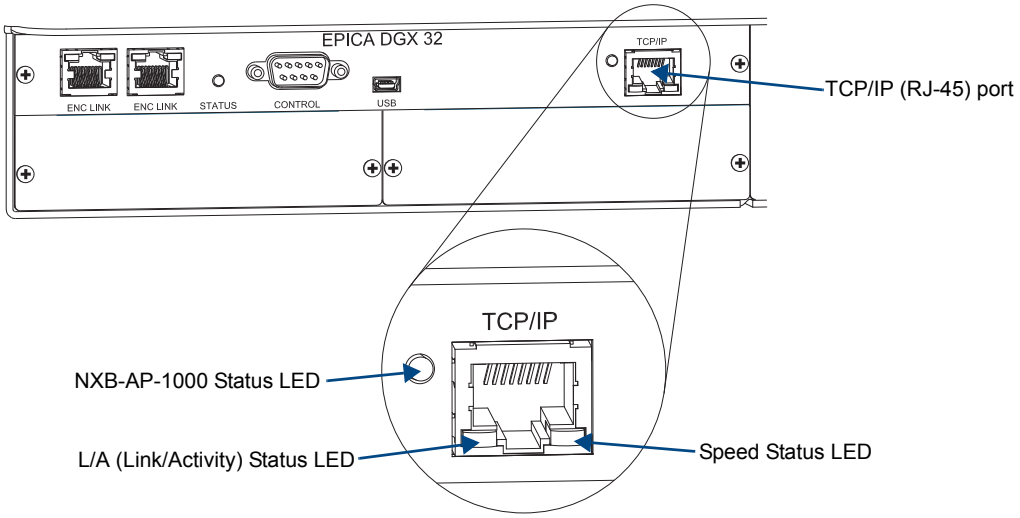


FIG. 27 TCP/IP port and LED indicators

The TCP/IP port is an Ethernet link connector, handling Ethernet 10/100 connections for 100 Mbps (megabits per second) and 10 Mbps. (This connection is compatible with most Ethernet based LANs.)

The round LED to the left of the TCP/IP port indicates the following:

- **Green NXB-AP-1000 Status LED**
  On (blinks on and off at 5 second intervals) – Connection status is active
  Off – Connection status is not active

The two small rectangular LEDs on the RJ-45 connector (FIG. 27) indicate the following:

- **Amber L/A (Link/Activity) Status LED**
  On – Link status is active (when the Ethernet cable is connected and terminated correctly)
  Off – Link status is not active
- **Green Speed Status LED**
  On – Speed status is 100 Mbps
  Off – Speed status is 10 Mbps

Note: *When the connection is made, the DHCP server on the network will automatically assign an IP address. If you power down and power back up, the DHCP server will reassign the IP address, which may or may not be the same address it assigned before. To prevent the possibility of the IP address changing at power up, you can change the DHCP address to a static IP address (see page 83).*

To connect an Epica DGX 16 or 32 to a LAN:

Important: *In order to use the NXB-AP-1000 connection, the Epica DGX 16 or 32 must establish an active connection to a LAN (network). Connecting the TCP/IP port on the Epica DGX 16 or 32 to a PC will not work.*

1. Complete the installation of the Epica DGX 16 or 32 system (see page 21) including power up of the system.
2. Insert one end of the RJ-45 link cable into the TCP/IP port on the enclosure.
3. Connect the other end of the RJ-45 link cable to a LAN hub or switch. The network will automatically assign a DHCP IP address (the assigned IP address can then be changed to a static IP address; see page 83).

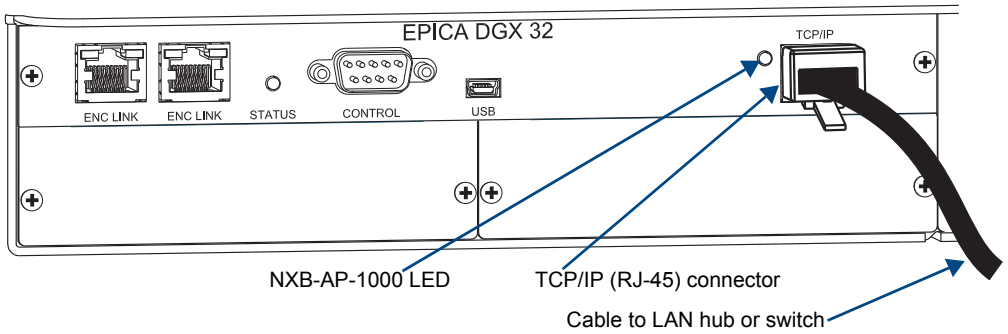


FIG. 28 RJ-45 link cable connected to TCP/IP port

4. Check the indicator LEDs for the TCP/IP connector (see page 43).
5. Complete one of the follow:
   NetLinx Studio WebConsole – Follow the instructions below for determining the IP address by accessing Zero-Config information. Make note of the IP address to use in the test procedure on page 45. NetLinx startup takes approximately 3 minutes.
   Or
   Third-party controllers – Contact your Network Administrator for the IP address to use in the test procedure on page 45.
6. Complete the installation by testing the connection (see the instructions on page 45).

Determining IP Address for NXB-AP-1000 Interface

The Epica DGX 16 and 32 both feature a built-in zero-configuration networking client that allows you to determine the unit's IP address for the NXB-AP-1000 interface via *Bonjour for Windows*® or a similar zero-configuration client. Zero-configuration (or zeroconf, also known as "Bonjour") technology provides a general method to discover services on a local area network. In essence, it allows you to set up a network without any configuration.

Accessing Zero-Config Information in the NetLinx Studio WebConsole

To determine the DHCP IP address that the network assigned to the Epica DGX 16 or 32 in Step 3 of the previous instructions, you can access the unit via NetLinx Studio.

NetLinx Studio version 3.0 (or higher) features a "Zero-Config" tab in the Workspace window. This tab provides Zero-Config networking functionality within NetLinx Studio.

Note: *Refer to the NetLinx Studio online help for details on using Zero-Config.*

The following assumes that the NXB-AP-1000 interface connection (TCP/IP port) is to the same LAN as the PC running NetLinx Studio and the NetLinx Master for the Epica DGX 16 or 32.

To determine the IP address by accessing the NXB-AP-1000 via Zero-Config:

1. In NetLinx Studio (v3.0 or higher), left-click the Zero-Config tab on the Workspace Bar to open the tab.

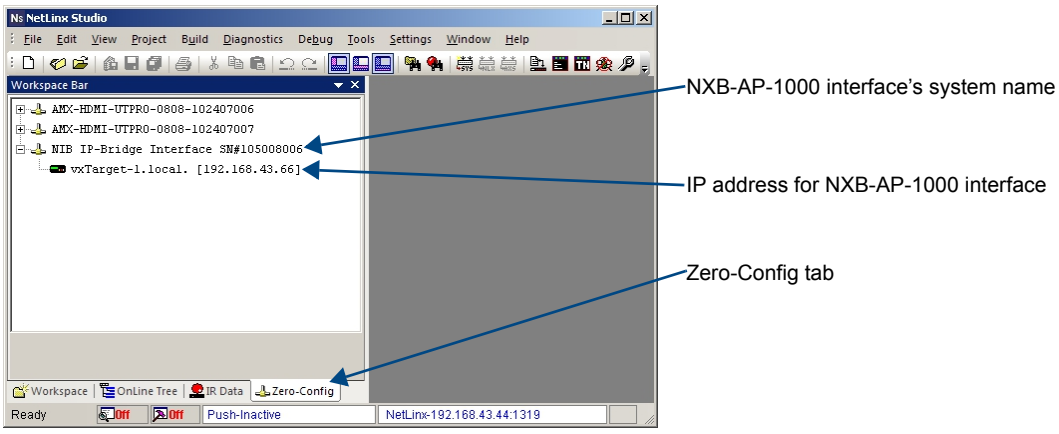


FIG. 29 NetLinx Studio showing the Zero-Config tab and the IP address for an NXB-AP-1000 interface

2. Right-click anywhere in the Workspace and select Refresh Zero-Config List to generate an initial listing of all Zero-Config devices that have been detected (FIG. 29).
3. Click the plus symbol (+) to the left of the "NIB IP-Bridge Interface" (the NXB-AP-1000 interface for the Epica DGX 16 or 32) in the Zero-Config list to expand its information.

The NXB-AP-1000 interface's current IP Address is listed below its system name of "NIB IP-Bridge Interface."

To test the NXB-AP-1000 connection:

1. Launch a browser on your PC.
2. In the address bar of the browser, type the IP address and press Enter (to determine the IP address, see the instructions above or contact your Network Administrator).
   If the NXB-AP-1000 interface does not open, see the "NXB-AP-1000 Troubleshooting" section on the next page.

For NXB-AP-1000 interface setup details, see the "NXB-AP-1000 Interface – Initial Setup by Network Admin" chapter on page 79.

Once set up, the NXB-AP-1000 interface includes the option of using an XBar controller which allows for remote control of an Epica DGX 16 or 32 Matrix Switcher (see page 95).

For additional information on Zero-Config or the WebConsole, see the *NetLinx Integrated Controllers WebConsole & Programming Guide* at **www.amx.com**.

NXB-AP-1000 Troubleshooting

Check the following:

- ❑ All power, signal, and link connections on all of the equipment.
- ❑ LED indicators for the TCP/IP (RJ-45) connector on the rear of the Epica DGX 16 or 32.
- ❑ If the LED indicators are not illuminated, check the cable type to make sure it meets cable requirements (see page 43).
- ❑ LED indicators on the NetLinx Master.
- ❑ Ping the system, i.e., at the DOS prompt enter: ping XXX.XXX.XXX.XXX (where XXX.XXX.XXX.XXX is the NXB-AP-1000 interface IP address; page 80).

Try the following:

- ❑ Try connecting to the NXB-AP-1000 interface again.
- ❑ If the NXB-AP-1000 interface still does not open, you may need to add an exception in the Proxy Setting dialog box (see page 101).

Tip: *Also check "Test Switch Troubleshooting" on page 41 and the troubleshooting information in the documentation for the NetLinx Master.*

If problems persist, contact technical support (see page 42).

Epica DGX SC Optical Boards

Applicability Notice

This chapter pertains to the following Epica DGX SC Optical Boards:

- FG1056-500 Input board
- FG1056-510 Output board

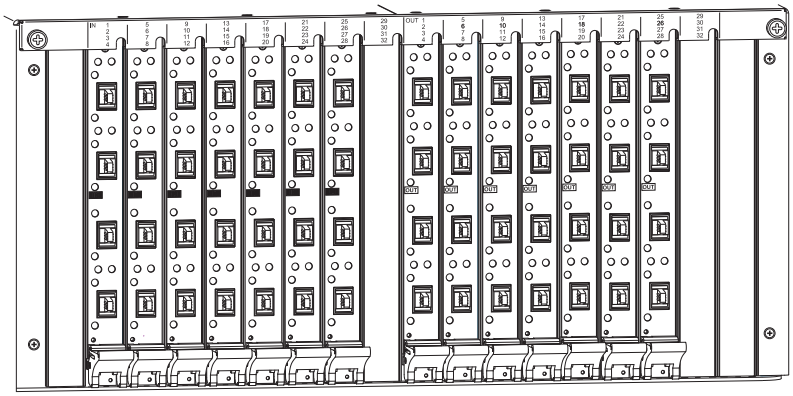


FIG. 30 Epica DGX SC Optical Boards, shown in an Epica DGX 32

Epica DGX 16

Epica DGX 16 enclosures are built to hold up to eight DGX SC Optical Boards with four inputs or outputs per board.

Each enclosure holds a maximum of four input and four output boards, accommodating connector configurations up to a maximum of 16x16, as well as subsets (for example, 16x8 or 4x12).

Epica DGX 32

Epica DGX 32 enclosures are built to hold up to sixteen DGX SC Optical Boards with four inputs or outputs per board.

Each enclosure holds a maximum of eight input and eight output boards, accommodating connector configurations up to a maximum of 32x32, as well as subsets (for example, 12x24 or 32x8).

Routing Signals

DGX SC Optical Input Boards route signals to DGX SC Optical Output Boards or to any other type of Epica DGX Output Boards. DGX SC Optical Output Boards accept signals from all types of Epica DGX Boards. When routing signals between different board types, the Epica DGX 16 or 32 automatically converts the signal format to match the output board.

Currently, the following signals can be sent over DGX SC Optical Boards: DVI-D, analog video, and digital or analog stereo audio. Supported analog video signals include RGBHV, RGBS, RGsB, and Y/Pb/Pr.

DGX SC Optical Boards *must* be used in conjunction with DGX Fiber modules (see the compatibility list on page 48 and the system setup information on page 49).

Specifications Epica DGX SC Optical Boards

Applies to input board FG1056-500 and output board FG1056-510.

Compatible AMX AutoPatch DGX Fiber modules:

- FG1010-200-01 – AVB-TX-DGX-HD15-SC Fiber
- FG1010-210-01 – AVB-TX-DGX-DVI-SC Fiber
- FG1010-400-01 – AVB-RX-DGX-SC Fiber-HD15
- FG1010-410-01 – AVB-RX-DGX-SC Fiber-DVI

Note: *Either Transmitter (TX) module can be used in conjunction with either Receiver (RX) module.*

Epica DGX SC Optical Specifications	
Parameter	**Value**
Compatible AMX AutoPatch Fiber Products	DGX HD-15 TX and RX, DGX DVI TX and RX, other AMX AutoPatch DGX SC Fiber signal management products
Signal Types over Fiber	Video, audio, serial data Video signal must be present to pass audio and serial data
Resolution Support	640x480 @ 60 Hz up to 1920x1200 @ 60 Hz
Interlaced Resolution Support	1080i 60, 59.94, 50 (fields per second) 576i 100, 50 (fields per second)* 480i 60 (fields per second)*
Audio Support	Analog stereo or S/PDIF (S/PDIF up to 96 kHz sample rate**)
Serial Data Support	Unidirectional RS-232, up to 115.2 k baud
Fiber Cable Type	Multimode Simplex (with SC termination) 50/125 µm (preferred) or 62.5/125 µm
Fiber Cable Length	Up to 3000 ft. (914.4 m) in with 50 µm cable*** Up to 3000 ft. (914.4 m) out with 50 µm cable*** Up to 1500 ft. (457.2 m) in with 62.5 µm cable Up to 1500 ft. (457.2 m) out with 62.5 µm cable
Optical Budget	9.75 dBm (typical) between DGX TX and input board 9.75 dBm (typical) between output board and DGX RX Optical Modulation Amplitude (OMA) Output: -6.25 dBm (typical) Optical Modulation Amplitude (OMA) Input Sensitivity: -16.0 dBm (typical)
Fiber Input Board Propagation Delay	1 µs
Fiber Output Board Propagation Delay	2 µs
Power Output of Laser Radiation (max.)	4.08 mW (SC optical output board)
Safety Certifications	Class 1 Laser Product (Class 3R Laser Product when fiber is disconnected from the unit) IEC 60825-1, 2001 (SC optical output board)
Fiber Connector	SC optical

* 480i and 576i are only available when being transmitted from a DGX HD-15 TX as a Y-Pb-Pr signal.

** 96 kHz audio is only available when the source video resolution is 800x600 @ 60 Hz (40 MHz pixel clock) or greater. Otherwise 48 kHz is the maximum.

*** 3000 ft. cable requires 50/125 µm OM2 class low loss fiber cable.

Important: *These boards are compatible only with other AMX AutoPatch products that support the DGX single fiber technology. They are not compatible with third-party optical distribution amplifiers or multimode to single-mode converters.*

AMX reserves the right to modify its products and their specifications without notice.

System Setup with DGX Modules

DGX SC Optical Input and Output Boards are used in conjunction with AMX AutoPatch DGX Fiber TX and RX modules. Compatible DGX Fiber modules are listed on page 48. System setup options are listed in a table on page 20. For module installation details, see the module's *Quick Start Guide* or *Installation Manual*.

When the modules are installed, image adjustment and EDID scaling is automatically applied. For almost every installation, the automatic features on the modules result in a satisfactory image on the monitor. If the installation has special requirements and needs additional adjustment or if you need product specifications for the modules, refer to the *Instruction Manual – DGX Transmitters & Receivers* on the *AMX AutoPatch CD* or at **www.amx.com**.

The distance from a DGX Fiber TX module to a DGX SC Optical Input Board can be up to 3,000 feet (914.4 m) and another 3,000 feet (914.4 m) from the DGX SC Optical Output Board to the DGX Fiber RX module.

Note: *Along with the video signal, the DGX SC Optical Boards support embedded digital audio and analog stereo audio from the DGX Fiber modules. They also support the transmission of unidirectional RS-232 (EIA-232) serial data over the fiber with the data flow in the same direction as the video signal.*

Important: *The RS-232 connection on the modules requires management of the RS-232 data line in relation to switching operations. In an upstream matrix switching scenario, we recommend that RS-232 control commands (via the DGX RS-232 data connection) are not sent immediately prior or subsequent to a matrix switching command. It is possible for the RS-232 data to be corrupted as the video (or audio) signal is removed and then restored by the matrix switcher.*

The system setup in FIG. 31 illustrates DGX SC Optical Boards used in conjunction with DGX modules. The DGX HD-15 TX and the DGX DVI TX modules can be installed interchangeably. DGX HD-15 RX and the DGX DVI RX Modules are interchangeable as well, providing for an extremely flexible system. For example, in the same system the source device can send a DVI signal and the destination device can receive an RGBHV signal.

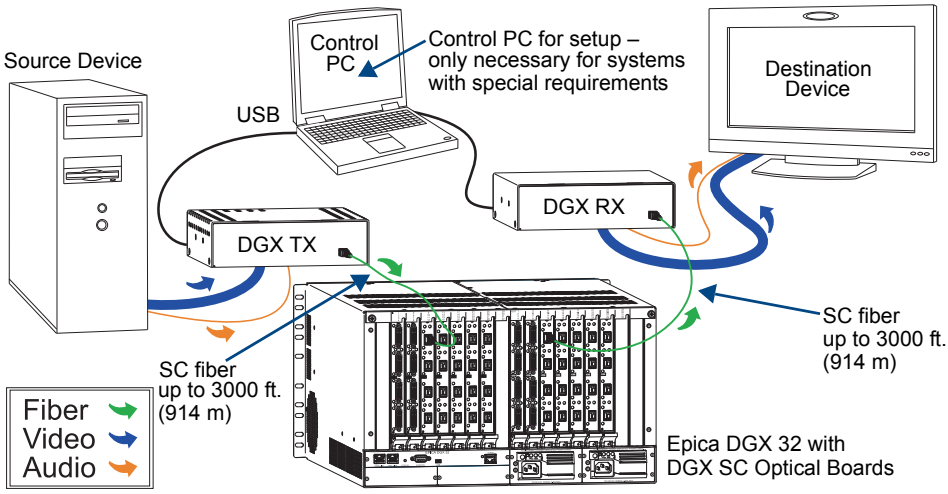


FIG. 31 DGX SC Optical Boards are used in conjunction with DGX Fiber modules

Tip: *For systems with special requirements – Before installing in the final location, place the equipment close together, so the Control PC and the destination monitor can be seen simultaneously if adjustments are necessary.*

Safety Recommendations for Laser Products

Important: *No user serviceable parts are included inside an AMX AutoPatch product; service should only be done by qualified personnel.*

Caution - *Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.*

Exercise caution when installing DGX products to avoid direct eye exposure to invisible laser radiation. Follow the recommendations below whenever installing or working with DGX products.

- ❑ Be sure to apply the power only after all fiber connections are made and no fiber ends are exposed.
- ❑ Do not remove dust plugs from SC fiber connectors or the dust caps from the fiber cables until establishing connections; avoid direct eye exposure.
- ❑ Make sure all cables, including fiber cables, are correctly connected and/or terminated.
- ❑ Before you unplug a fiber cable on an input board, disconnect the power on the DGX TX that is connected to the input.
- ❑ Before you unplug a fiber cable on an output board, disconnect the switch for that output connector.

Attaching Cables

Instructions for attaching AMX AutoPatch cable management bars are on page 23. These bars are recommended and provided with each DGX SC Optical Board.

Caution: *Do not severely bend or kink the SC fiber cable. Irreversible damage can occur. Refer to the physical limitations (bend radius) specified for the cable. The bend radius for AMX SC terminated fiber cables is 2 inches (5 cm).*

Check When Fastening Fiber Cables:

- ❑ Make sure that no dust or debris is on the exposed ends of the fiber cable.
- ❑ Make sure that the fiber cable connectors seat firmly into the board and module fiber connectors.
  Normally an audible click is heard when a connector engages.

To connect SC fiber inputs and outputs:

1. Recommended – Install the provided cable management bars (see page 23).

Caution: *CLASS 3R INVISIBLE LASER RADIATION WHEN OPEN; AVOID DIRECT EYE EXPOSURE.*

2. Clean the fiber cable connector – Follow the manufacturer's recommendations.
3. Remove the protective cap from the SC fiber connector.

4. Insert the fiber cable connector into the input and output SC fiber receptacles (FIG. 32).

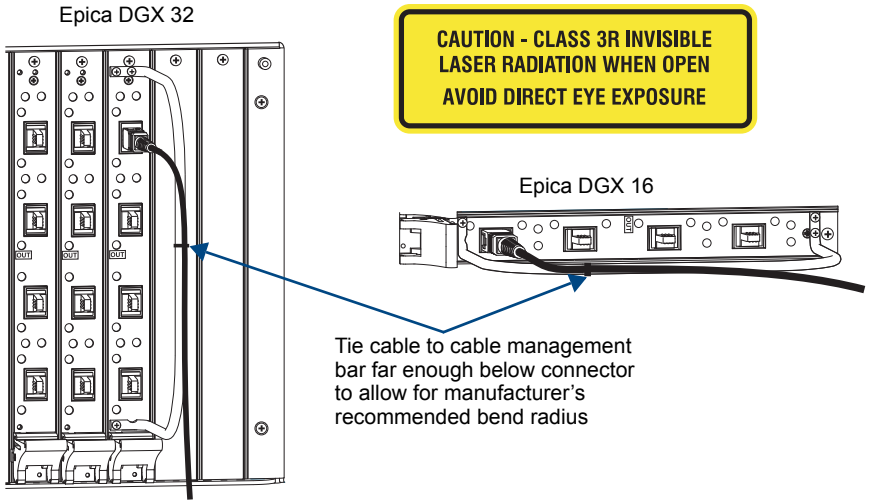

Epica DGX 32
CAUTION - CLASS 3R INVISIBLE
LASER RADIATION WHEN OPEN
AVOID DIRECT EYE EXPOSURE
Epica DGX 16
Tie cable to cable management
bar far enough below connector
to allow for manufacturer's
recommended bend radius

FIG. 32 Fasten cables onto input and output connectors (shown with cable management bar)

5. Tie the SC fiber cable to the cable management bar far enough below the connector to allow for the manufacturer's recommended bend radius. The bend radius for AMX SC terminated fiber cables is 2 inches (5 cm).
6. Repeat the previous steps for the remaining fiber cables.

Important: *The RS-232 connection on the modules requires management of the RS-232 data line in relation to switching operations. In an upstream matrix switching scenario, we recommend that RS-232 control commands (via the DGX RS-232 data connection) are not sent immediately prior or subsequent to a matrix switching command. It is possible for the RS-232 data to be corrupted as the video (or audio) signal is removed and then restored by the matrix switcher.*

Epica DGX DVI Boards

Applicability Notice

This chapter pertains to the following Epica DGX DVI (Digital Visual Interface) Boards:

- FG1056-520 Input board
- FG1056-530 Output board

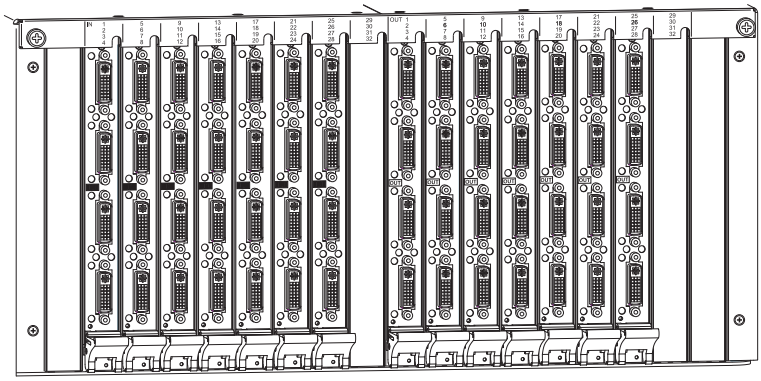


FIG. 33 Epica DGX DVI Input and Output Boards

Epica DGX 16

Epica DGX 16 enclosures are built to hold up to eight DGX DVI Boards with four inputs or outputs per board. Each enclosure holds a maximum of four input and four output boards, accommodating connector configurations up to a maximum of 16x16, as well as subsets (for example, 16x8 or 4x12).

Epica DGX 32

Epica DGX 32 enclosures are built to hold up to sixteen DGX DVI Boards with four inputs or outputs per board. Each enclosure holds a maximum of eight input and eight output boards, accommodating connector configurations up to a maximum of 32x32, as well as subsets in increments of four (e.g., 12x16 or 24x8).

Note: *DGX DVI Boards are the only type of board in the three pre-engineered Epica DGX 16 systems and in the nine pre-engineered Epica DGX 32 systems. The configurations for these systems and their model numbers are on page 7.*

Signal Routing

Generally, DGX DVI Input Boards can also route signals to other types of Epica DGX Boards, and DGX DVI Output Boards can also accept signals from other types of Epica DGX Boards. When routing from one board type to another, the Epica DGX 16 or 32 automatically converts the signal format to match the output board.

DGX DVI boards only support digital, single link (DVI-D) signals. (When DGX DVI Input Boards are used with DGX SC Optical Output Boards, the signals are converted to fiber and then converted by a DGX RX; see "System Setup with DGX Modules" on page 49). The connectors on the boards are DVI-I connectors, which allow use of cables with either DVI-D or DVI-I connectors (for DVI-I, the analog pins are not used; see the DVI-I connector pinout information on page 55).

The DGX DVI Boards provide EDID emulation support with plug-and-play information provided by the Epica DGX 16 or 32 Distribution Matrix.

Important: *The DGX DVI Boards do not support HDCP required compliant signals. In addition, the DGX DVI Output Board does not support audio or serial data from a DGX SC Optical Input Board.*

EDID Programmer software is included on the *AMX AutoPatch CD* (also available at **www.amx.com**) for re-programming the input boards if necessary (see "Appendix A – EDID Programmer" on page 109).

Specifications Epica DGX DVI

Applies to input board FG1056-520 and output board FG1056-530.

Digital Video – DVI Specifications	
Parameter	**Value**
Signal Type	DVI-D (single link)
Resolution Support	640x480 @ 60 Hz up to 1920x1200 @ 60 Hz
Interlaced Resolution Support	1080i 60, 59.94, 50 (fields per second) 576i 100, 50 (fields per second) 480i 60 (fields per second)
Data Rate (max.)	4.95 Gbps
Pixel Clock (max.)	165 MHz
DDC/EDID Support	EDID provided by Epica DGX 16 or 32 EDID is user re-programmable
HDCP Support	No
Input Voltage (nominal)	1.0 Vpp differential
Input Cable Equalization	Up to 50 ft. (15.24 m)
Output Voltage (nominal)	1.0 Vpp differential
Output Reclocking	Yes
Output +5 V DDC Pin	250 mA
Output Rise Time / Fall Time	80 ps min. to 200 ps max. (20% to 80%) 0.13 UI min. to 0.33 UI max. (@ 1.65 Gbps, 20% to 80%)
DVI Input Board Propagation Delay	1 µs
DVI Output Board Propagation Delay	2 µs
Connector	DVI-I (DVI-D single link is the supported signal type)

EDID Resolutions Supported through Local DDC

Standard Timings

Standard Timing Identification	Resolutions	Refresh Rate Max.**
ID 1	1920x1200*	60 Hz
ID 2	1920x1080	60 Hz
ID 3	1680x1050	60 Hz
ID 4	1600x1200	60 Hz
ID 5	1280x800	60 Hz
ID 6	1280x720	60 Hz
ID 7	1280x1024	60 Hz
ID 8	640x480	120 Hz

* This is the preferred timing identified in the EDID.

Established Timings

Resolutions	Refresh Rate Max.**
640x480	60 Hz, 72 Hz, 75 Hz
800x600	56 Hz, 60 Hz, 72 Hz, 75 Hz
1024x768	60 Hz, 70 Hz, 75 Hz, 87 Hz
1280x1024	75 Hz

** Some monitors may not support the maximum refresh rate.

AMX reserves the right to modify its products and their specifications without notice.

Attaching Cables

To connect DVI inputs and outputs:

1. Fasten the DVI-I (or DVI-D) connectors on the cable ends onto the DVI-I receptacles on the boards. (For DVI pinout information, see below.)

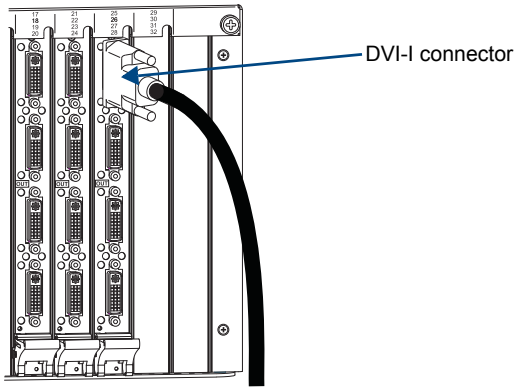
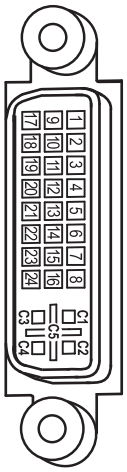


FIG. 34 Fasten cables onto input and output connectors

DVI Pinout

Pinout information for the DVI-I connector on the DGX DVI Input and Output Boards is provided in the chart in FIG. 35.



DVI-I Pinout			
1. Data 2-	9. Data 1-	17. Data 0-	C1. No connect
2. Data 2+	10. Data 1+	18. Data 0+	C2. No connect
3. Ground	11. Ground	19. Ground	C3. No connect
4. No connect	12. No connect	20. No connect	C4. No connect
5. No connect	13. No connect	21. No connect	C5. No connect
6. DDC-CLK	14. +5 V*	22. Ground	
7. DDC-Data	15. Ground	23. CLK+	
8. No connect	16. Hot-Detect	24. CLK-	

* DVI output pin 14 (+5 VDC out) supplies 1 A shared total available for all four outputs.

FIG. 35 DVI-I connector pinout

Control Panel Operation

Overview

The Epica DGX 16 and 32 Control Panels (standard on all enclosures) are used for controlling system switches and system attributes. Both control panels function the same, but have input and output key support respective to their size.

Note: *AMX AutoPatch software can also be used to control a system; for more information on control options, see page 15.*

The Control Panel has an LCD, a Function Key, Control Dial, Select Key, Cancel Key, Take Key, Input and Output Keys, and Power Indicator. The Control Dial and Select Key work together for scrolling through the menu items displayed on the LCD to place the system into various modes (the types of operations, e.g., Change Mode to execute switches) or to access lists for control operations. Once in the desired mode, use the Input and Output Keys to select values and the Take Key to execute the operations (some modes require using the Control Dial and Select Key to select values).

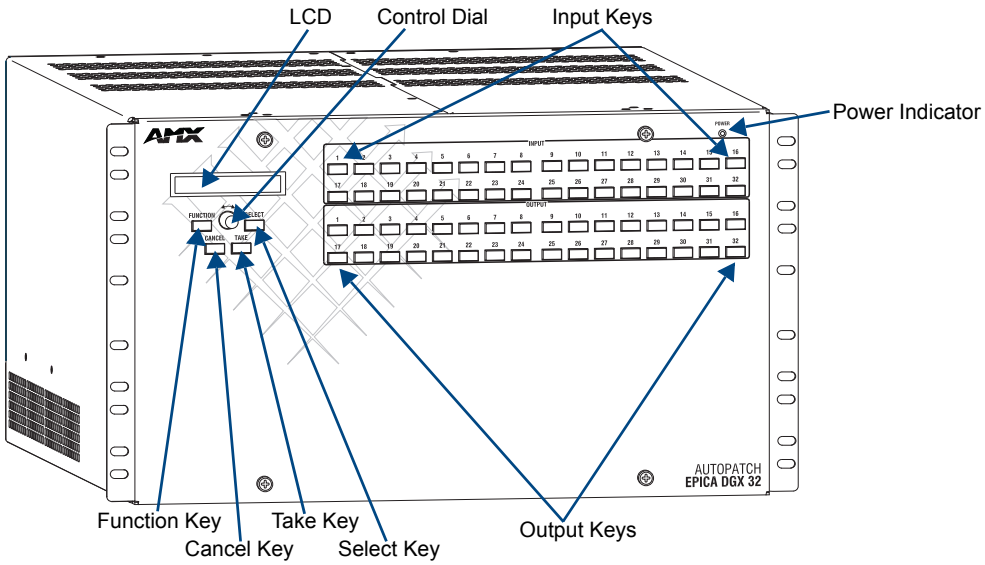


FIG. 36 Control Panel, shown on an Epica DGX 32

Control Keys and Dial

Function Key

The Function Key accesses the Function menu on the LCD. As the Control Dial is scrolled, the menu displays the various command options, e.g., Change and Status. The Function Key can be pressed at anytime to return the display to the Function menu. For an overview of the menu options, see page 59.

Select Key

The Select Key enters a selection. In addition, the Select Key can be used to execute global or local presets. However, the Select Key *cannot* execute or disconnect switches. Pressing the Take key executes or disconnects switches.

Cancel Key

Pressing the Cancel Key clears an incomplete operation and returns the display to the beginning of a submenu or list. The Cancel Key *cannot* undo a completed operation, e.g., an operation followed by the pressing of the Take Key. If the Cancel Key flashes, an error has occurred; a flashing Cancel Key *must* be pressed before continuing.

Control Keys and Dial (continued)

Take Key

The Take Key functions much like the Enter Key on a computer keyboard. Pressing the Take Key instructs the system to execute or disconnect a switch. Prior to pressing the Take Key, the individual operation component(s) are selected by pressing the appropriate key(s).

Control Dial

The Control Dial scrolls through the menu options and adjusts values. The Control Dial is used in conjunction with the Select Key to choose the commands and values on the LCD and change virtual matrices between standard virtual matrix configurations and any custom virtual matrices.

Input and Output Keys

Input and Output Keys correspond to the input and output connections on the rear of the enclosure. These keys are used to select the inputs and outputs for routing source signals to destination devices, as well as for status operations. Input Keys are also used for locking and unlocking the Control Panel.

When an Input or Output Key is pressed, the channel name (e.g., O_Ch:0003 for Output 3) displays on the LCD. Hold the key down to display the name longer.

The color of the Input and Output Keys indicate availability or selection:

- **Blue key** – indicates the input or output is available for selection as part of the current operation.
- **White or flashing white key** – indicates an input or output has been selected and that additional action is required to complete the operation. When verifying Status, the key corresponding to the selected input or output is white; a key(s) for the input or outputs that are connected to the selected key turn white. When a key is flashing white, it cannot be unselected and does not display label information on the LCD when pressed. Select another key or press the Cancel Key to unselect.
- **Non-illuminated key** – indicates the input or output is not available for the current operation, e.g., if the enclosure's configuration size is not a full 32x32, some keys are always unavailable (never illuminated) because they do not have a corresponding connector on the rear.

FIG. 37 shows various keys states while in Change Mode. Input Key 19 is flashing white, indicating that input was selected first. Outputs Keys 4 and 5 are white, indicating that those outputs have also been selected (and can be unselected). The switch from Input 19 to Outputs 4 and 5 will be executed when the Take Key is pressed. Note that Keys 21 through 24 in the second row of inputs are not available.

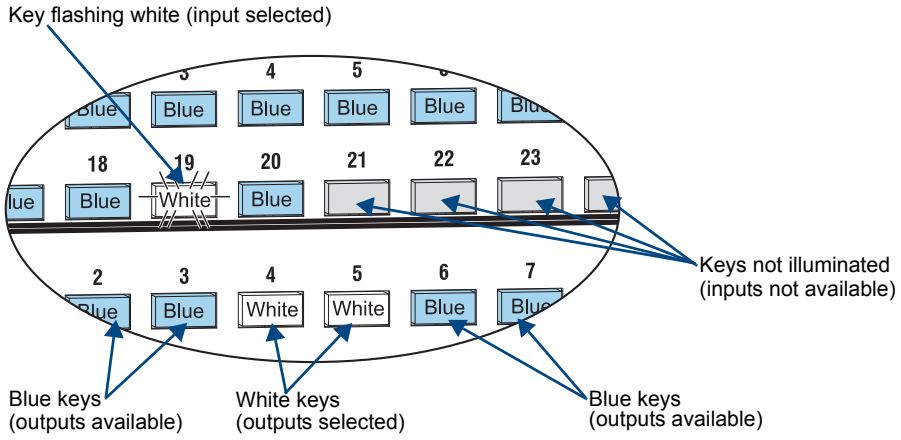
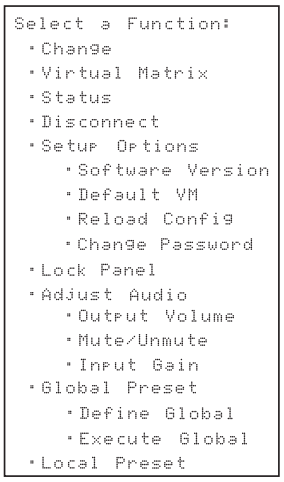


FIG. 37 Example of key states during Change Mode (Control Panel on an Epica DGX 32)

Menus and Modes



Function menu structure

The Function menu and its submenus access the modes and functions used to control the system. The modes are Change, Virtual Matrix, Status, Disconnect, Setup Options, Lock Panel, Global Preset, and Local Preset. While in a mode, the same command can be repeated, without having to return to the Function menu to reselect the mode, e.g., executing more than one local preset.

Use the Control Dial and Select Key to navigate the Function menu, and submenus. The Function menu and the submenus are loop menus, which means that each menu returns to its first item after you scroll past its last item.

Note: *A clear label with white lettering that shows the entire LCD Function menu (as shown to the right) is included in the Control Panel Label Kit shipped with the system. Dust surface of panel near the LCD with a dry cloth (if necessary, use a non-abrasive cleaner), peel the backing off of the label, and firmly press the label on panel.*

The Function menu (see right) and its submenus access the following modes and functions:

Change

Selecting Change places the system in Change Mode. The Control Panel *must* be in Change Mode to execute switches. While in Change Mode, select the Input and Output(s) Keys followed by the Take Key to execute switches (see page 61).

Virtual Matrix

Selecting the Virtual Matrix Mode accesses the virtual matrices designated for the system in the configuration file (VM 0, VM 1, and any custom virtual matrices). The Virtual Matrix Mode can be selected to change the virtual matrix currently used to execute operations (see page 62).

Status

Selecting Status places the system in Status Mode. Status Mode is used to confirm signal routing or routing to multiple outputs without risk of accidentally executing a switch (see page 64).

Disconnect

Selecting Disconnect places the system in Disconnect Mode. While in Disconnect Mode, select the Input or Output Key(s) followed by the Take Key to disconnect switches (see page 63). While in Disconnect Mode, the Control Panel does not indicate the current routing of selected inputs or outputs.

Setup Options

Selecting Setup Options (see page 73) accesses the Setup Options submenu to check the software version, change the default virtual matrix, reload the configuration file (when directed to do so by technical support), and change the Control Panel password.

Lock Panel

Selecting Lock Panel places the Control Panel in Lock Mode at which time the password is entered to lock the panel. Locking the panel limits access which can prevent accidental switches (see page 72).

Adjust Audio

This menu item will not display unless the Epica DGX 16 or 32 is linked to an enclosure that supports audio functions. Selecting Adjust Audio accesses the Adjust Audio submenu. From this menu, you can place the panel in Output Volume Mode, Mute/Unmute Mode, or Input Gain Mode (see page 68).

Global Preset

Selecting Global Preset accesses the Global Preset submenu to execute global presets or define global presets (see page 65).

Local Preset

Selecting Local Preset accesses the list of local presets that can be executed (see page 67). Local Preset will only appear as an option on the Function menu if local presets have been defined in XNConnect for the selected virtual matrix.

Epica DGX 16 and 32 Control Panel operation consists of the following four basic tasks:

- **Choosing a mode, submenu, or list:** press the Function Key to access the Function menu. Use the Control Dial and Select Key to choose the desired mode, submenu, list, or list item.
- **Selecting Inputs or outputs:** press the corresponding Input or Output Key. Selected keys will change color or flash, depending on the routing state.
- **Selecting values for fields:** use the Control Dial and Select Key (e.g., virtual matrices or global presets).
- **Executing a command:** press the Take Key.

Labeling Input and Output Keys

Each Epica DGX 16 and 32 system ships with a kit for custom labeling. Additional kits may be ordered separately. The Control Panel Label Kit (KA1056-01) includes:

- **Perforated card stock sheets** – Print, separate labels, and slide into holders.
- **Label holders** – Attach to the front panel above each row of Input and Output Keys.
- **LCD Function menu label** – Shows entire LCD menu structure (see Note on previous page).

The label template (an .xlt template formatted in Microsoft Excel) for labeling the input and output keys is included on the *AMX AutoPatch CD* and is available at **www.amx.com**.

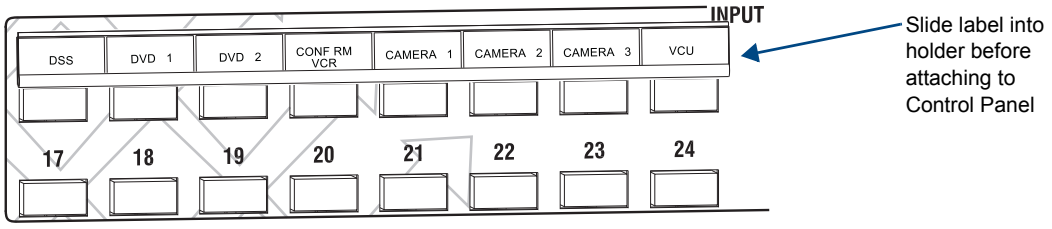


FIG. 38 Customize labels to designate sources and destinations (Control Panel on an Epica DGX 32)

Tip: *When the labels are ready to print, we recommend printing a sample on plain paper first.*

To create and install labels for Input and Output Keys:

1. From the *AMX AutoPatch CD*, launch the Label Form Spreadsheet.xlt file.
2. Type the labels in the pre-formatted cells on the template according to the instructions in the template (if desired, use standard Excel editing tools to alter font size, spacing, color, etc.). *Do not modify the cell size.*
3. Save the file for future use (recommended).
4. Print the labels on the perforated sheets provided, using any standard laser printer.
5. Trim off the excess label insert material where indicated.
6. Separate the label strips at their perforations (bend both ways first).
7. Slide the first label strip into a plastic label holder (position with open edge of holder up).
8. Peel the adhesive backing off the label holder and press the holder firmly onto the Control Panel above the appropriate Input or Output Keys. The silk screened labels on the front panel will aid in label holder alignment.
9. Repeat Steps 7 and 8 for the remaining labels.

Executing Switches

A switch is an active connection between an input (source) device and one or more output (destination) devices. The signals routed in a switching operation are individual signals or groups of individual signals coming through the connectors on the rear of an enclosure. You can execute switches from the Control Panel using the steps below or by defining and executing a global preset (see page 65) or by executing a local preset (see page 67).

The LCD displays VM 0 or VM 1 (or any custom virtual matrix) in the upper-right corner; this is the virtual matrix that operations are currently being executed on. Switches are executed on the default virtual matrix unless otherwise specified. When specifying a virtual matrix, be sure it includes the signal(s) you want to route.

Note: *When audio is transmitted along with the video over the fiber, the audio switches on the same VM as the video (the audio and video cannot be switched independently).*

Note: *When using the control panel on an Epica DGX 16 or 32 to control a larger matrix switcher in a linked system, the number of inputs and outputs that can be controlled on the larger matrix switcher cannot be greater than the number of ones available on the Epica DGX 16 or 32. The virtual matrices on the larger matrix switcher must be configured accordingly.*

Virtual matrix definitions reside in the configuration information in an enclosure's CPU. If you need to change the virtual matrix, see "Changing the Virtual Matrix" on page 62. If you decide to change the default virtual matrix, see page 73 for "Setup Options."

When an Input or Output Key is pressed, the LCD displays the channel name (e.g., O_Ch:0003 for Output 3). Hold the key down to display the name longer.

You can return to the Function menu at any time by pressing the Function Key.

Note: *When you put the panel in Change Mode, available keys will be blue and any unavailable ones will not be illuminated. The first blue key selected flashes white and the next key(s) selected turns white. You can toggle the non-flashing white keys between the selected (white) and unselected (blue) state before pressing the Take Key. For an example, see FIG. 37 on page 58.*

In an execute switch command either an input or an output may be selected first. To switch to multiple outputs, the Input Key *must* be selected first. With the Control Panel you can select and unselect Input and Output Keys to modify the switch as long as the keys are not flashing. Once satisfied with the switch selections, press the Take Key to execute it. (Or, if not satisfied with the selections, press the Cancel Key and start over.)

For new installations, we recommend executing a test switch to verify the system is working correctly before attaching all inputs and outputs. To execute a test switch, attach the first input (source) and first output (destination) and then complete the directions below. For more information on test switches, see page 40.

The directions below switch Input 1 to Output 1 on the currently selected virtual matrix.

To execute a test switch:

1. Press the Function Key.
   The Function menu appears.

2. Press the Select Key to choose Change.
   The system is in Change Mode (the available Input and Output Keys turn blue).

3. Press Input Key 1.
   Input Key 1 flashes indicating that it is ready to switch.
   (Any outputs currently connected to Input 1 will turn white.)
4. Press Output Key 1.
   Output Key 1 illuminates indicating that it is ready to accept the switch.
5. Press the Take Key.
   Input 1 switches to Output 1, and the keys turn blue.
   The panel remains in Change Mode until the Function Key is pressed.

Changing the Virtual Matrix

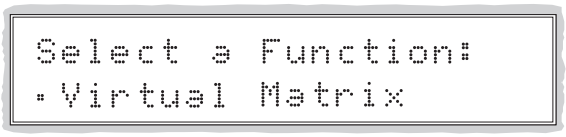
Epica DGX 16 and 32 systems support two virtual matrices for switching signals, VM 0 = "All" and VM 1 = "Video." The system also supports any custom virtual matrices created in XNConnect; 2 digits are the maximum allowed (0 through 99). VM 0 is the factory default, and for the Epica DGX 16 and 32, VM 0 normally routes the same as VM 1. If you create a custom configuration, you will need to change the virtual matrix on the Control Panel to execute switches (or other operations) using the custom virtual matrix.

Note: *When audio is transmitted along with the video over fiber cable, the audio switches on the same VM as the video (the audio and video cannot be switched independently).*

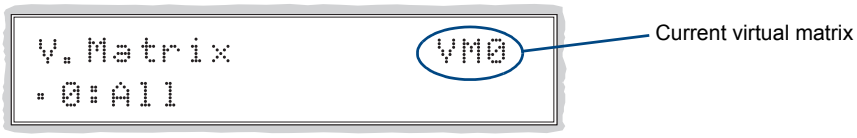
The directions below give the steps to change from routing signals on VM 0 to routing on a custom configuration (VM 2).

To change the virtual matrix:

1. Press the Function Key.
   The Function menu appears.
2. Locate Virtual Matrix by scrolling with the Control Dial.



3. Press the Select Key.
   The V.Matrix list appears.



4. Scroll with the Control Dial to 2:Custom.

5. Press the Select Key to enter your selection.
   The display returns to the top of the V.Matrix submenu.
   VM 2 “Custom” becomes the new virtual matrix used for all operations.

6. Press the Function Key to return to the Function menu.
   The system is ready to execute operations on VM 2. The system will remain on VM 2 for all operations until the virtual matrix is changed or the power is cycled (at which time the Control Panel will switch on the default virtual matrix).

Note: *To change the default virtual matrix, see the instructions on page 74.*

Disconnecting Switches

Disconnecting a switch deactivates the connection between an input (source) and one or more output (destination) devices. Disconnecting an input will disconnect all outputs currently receiving the input's signal. An output can only be connected to one input; therefore, disconnecting an output will only disconnect the connection between the output and the input that is routed to it. Inputs and outputs can be selected in the same disconnect command.

You can disconnect inputs or outputs from the Control Panel using the steps below. If you need to change the virtual matrix, see “Changing the Virtual Matrix” on page 62.

Note: *When you put the panel in Disconnect Mode, the available keys will be blue and any unavailable ones will not be illuminated. When you select a blue key, it turns white. You can toggle the keys between the selected (white) and unselected (blue) state before pressing the Take Key. An example is provided in FIG. 37 on page 58.*

Once the Control Panel is in Disconnect Mode, inputs and outputs can be selected and unselected by pressing the corresponding Input and Output Keys. The disconnect command is not executed until the Take Key is pressed. Pressing the Cancel Key clears an incomplete disconnect command and returns the display to the beginning of the submenu.

While in Disconnect Mode, the Control Panel will not show current routing for the inputs and outputs that are selected.

Caution: *Disconnecting an input disconnects all outputs receiving that source signal even if a specific output(s) is selected at the same time.*

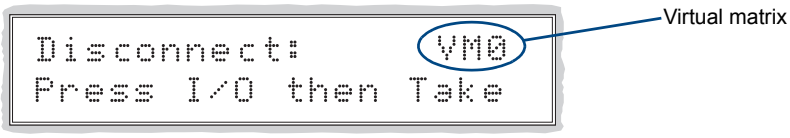
The example below disconnects Inputs 1 and 3 and all outputs connected to them as well as Output 9.

To disconnect inputs and outputs:

1. Press the Function Key.
   The Function menu appears.

2. Locate Disconnect by scrolling with the Control Dial.

3. Press the Select Key.
   The system is in Disconnect Mode (all the available Input and Output Keys turn blue).
4. Press Input Keys 1 and 3 and Output Key 9.
   The keys turn white indicating that they are selected.



5. Press the Take Key.
   Inputs 1 and 3 (and all outputs connected to them) and Output 9 are disconnected as soon as the Take Key is pressed and the keys turn blue.
6. Make additional disconnects.
   Or press the Function Key to return to the Function menu.

Verifying Signal Status

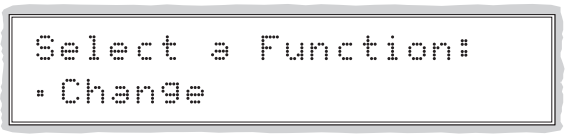
The status of inputs or outputs can be checked using the Epica DGX 16 and 32 Control Panel. Signal status can be verified to confirm that a switch has executed properly or to confirm correct routing to multiple outputs (destinations). Verifying an input will illuminate all outputs currently receiving the input's signal. An output can only be connected to one input (source); therefore, verifying the status of an output will illuminate only the one input that is currently routed to it.

Once the Control Panel is in Status Mode, inputs and outputs can be selected by pressing the corresponding Input and Output Keys without changing the routing state. The panel stays in Status Mode until the Function Key is pressed.

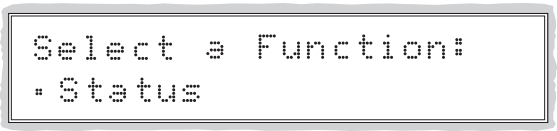
To verify signal status on a different virtual matrix, see "Changing the Virtual Matrix" on page 62.

To verify the status of a signal:

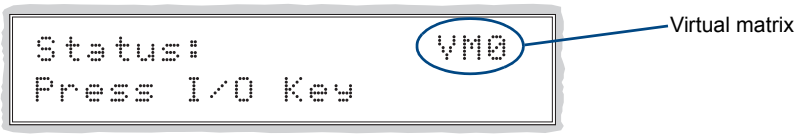
1. Press the Function Key.
   The Function menu appears.



2. Locate Status by scrolling with the Control Dial.



3. Press the Select Key.
   The system is in Status Mode (all available Input and Output Keys turn blue).



4. Press the Input Key that corresponds to the input you want to check.
   The selected Input Key turns white, and any Output Keys receiving the input signal also turn white.
   Or press the Output Key that corresponds to the output you want to check.
   The selected Output Key turns white, and if an Input Key routed to it, that key also turns white.

5. Select another signal to verify.
   Or press the Function Key to return to the Function menu.

Defining and Executing Global Presets

Global presets are predefined sets of switches that can easily be executed at one time. A global preset number can be assigned to a routing state during runtime and stored by the system, allowing you to replicate an entire system state. (The system state includes any special settings and all signal routings.) That system state can be restored at any time by selecting the assigned global preset number. Global presets can be defined or recalled using either the Control Panel or BCS commands interchangeably. Control Panel on the Epica DGX 16 and 32 supports up to 64 global presets.

Defining Global Presets

A global preset is a snapshot of an entire system's state which enables that system state to be recalled at a later time. Before defining a global preset, the system *must* be routed to the desired state.

Because all 64 potential global preset numbers are displayed in the Global Preset submenu, be aware that nothing indicates which of the numbers have been assigned a routing state.

Caution: *We strongly recommend keeping track of the number and the system state routing used for each global preset. If a previously used number is assigned to another system state (using either the Control Panel or BCS commands), the former state will be automatically overwritten.*

The example below defines Global Preset 3, and the example on the next page executes Global Preset 3.

Important: *Wait approximately ten seconds for the system to permanently store the global preset setting before executing another operation.*

To define a global preset:

1. Route the system to the desired state.
2. Press the Function Key.
   The Function menu appears.
3. Locate Global Preset by scrolling with the Control Dial.

```
Select a Function:
▪Global Preset
```

4. Press the Select Key.
   The Global Preset submenu appears.

```
Global Preset:
▪Define Global
```

5. Scroll with the Control Dial to Define Global.
   Press the Select Key.
   The Define Global list appears.

```
Define Global:
▪1:Global Preset 1
```

6. Scroll with the Control Dial until Global Preset 3 appears.

7. Press either the Select Key or the Take Key.
8. Wait approximately ten seconds for the system to store the global preset setting.
   The current routing state can now be recalled as Global Preset 3, and the system returns to the Global Preset submenu.
9. Press the Function Key to return to the Function menu.

Executing Global Presets

To execute a global preset:

1. Press the Function Key.
   The Function menu appears.
2. Locate Global Preset by scrolling with the Control Dial.
3. Press the Select Key.
   Execute Global appears.
4. Press the Select Key.
   The Execute Global Preset list appears.

5. Scroll with the Control Dial until Global Preset 3 appears.

6. Press either the Select Key or the Take Key.
   Global Preset 3 is executed.
   The system returns to the Global Preset submenu.
7. Press the Function Key to return to the Function menu.

Note: *Status is not invalidated by global presets.*

Executing Local Presets

A local preset is a predetermined set of switches on a particular virtual matrix that are routed simultaneously. They are stored in each enclosure's configuration file and can be executed at any time. Local Preset will not appear as a submenu option in the Function menu if local presets have not already been defined. In addition, they will not appear if the system is on a virtual matrix that does not have local presets. The Epica DGX supports 335 local presets.

Local presets are not programmed (defined) at the factory. To program them, use XNConnect configuration software (see page 122) or contact your AMX representative (for contact information, see page 42). Once the local presets have been defined as part of the configuration file, the new file *must* be loaded to the system's CPU (see page 124) and reloaded to the Control Panel (see page 75).

Make sure the Control Panel is switching on the virtual matrix where the local preset resides. If no local presets have been defined for the selected VM, the Local Preset submenu option will not be available on the Function menu.

Note: *Executing a local preset does not change any system routings that are not part of the preset.*

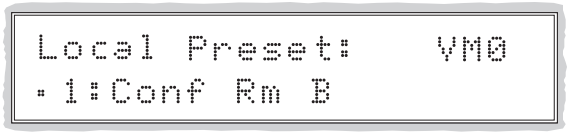
The example below executes Local Preset 3 "Discon Conf Rm B" on VM 0.

To execute a local preset:

1. Press the Function Key.
   The Function menu appears.

2. Locate Local Preset by scrolling with the Control Dial.

3. Press the Select Key.
   The Local Preset list appears.



4. Scroll to Local Preset 3.

5. Press either the Select Key or the Take Key.
   Local Preset 3 is executed.
6. Execute another local preset.
   Or
   Press the Function Key to return to the Function menu.

Adjusting Audio

Important: *This section of the manual does not apply to embedded audio transmitted over SC fiber cables.*

Some audio boards in AMX AutoPatch Distribution Matrices offer optional volume control and digital input gain adjustment features. If your Epica DGX 16 or 32 system is linked to an enclosure that contains these boards, output volume or digital input gain can be adjusted using either the Control Panel or BCS commands sent through a serial controller. For more information on audio adjustment using BCS commands, see the *Instruction Manual – BCS Basic Control Structure Protocol* at **www.amx.com**.

The Adjust Volume Screen displays the current volume setting and the range available for the specific audio output board that has been selected for adjustment. The Adjust Input Gain Screen displays the current gain setting and the range available for the specific audio input board that has been selected for adjustment.

When volume or digital input gain is adjusted for a device on one virtual matrix, the adjustment remains in effect for that device on all virtual matrix switching audio signals.

Important: *For AMX AutoPatch systems, the total through-system gain (the amount of input gain plus the amount of output gain) specified for any input/output routing path cannot exceed 10 dBr. If you enter a volume (gain) command that exceeds 10 dBr when it is combined with the gain of an input, the command will be accepted (and will be indicated in status results) but will not result in an audible difference of more than 10 dBr.*

When the panel is placed in any of the Audio Modes, available keys will be blue and any unavailable ones will not be illuminated. When you select a blue key, it turns white indicating that it is ready for the audio adjustment.

You can adjust output volume, mute outputs, and adjust input gain from the Control Panel using the steps below.

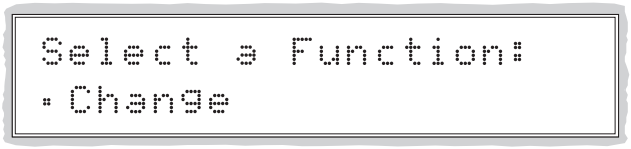
You can return to the Function menu at any time by pressing the Function Key.

Adjusting Output Volume

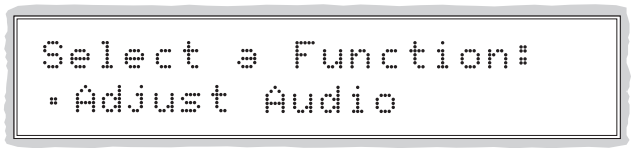
If an Epica DGX 16 or 32 is linked to an enclosure that supports volume control, adjustments (within the volume range for the specific audio output board) can be made at any time during time normal operation. When audio is adjusted for a device on one virtual matrix, the adjustment remains in effect for that device on all virtual matrices switching audio signals.

To adjust the volume:

1. Press the Function Key.
   The Function menu appears.

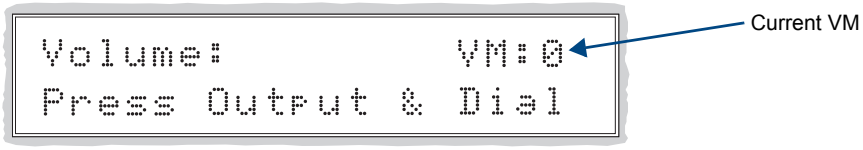


2. Locate Adjust Audio by scrolling with the Control Dial.

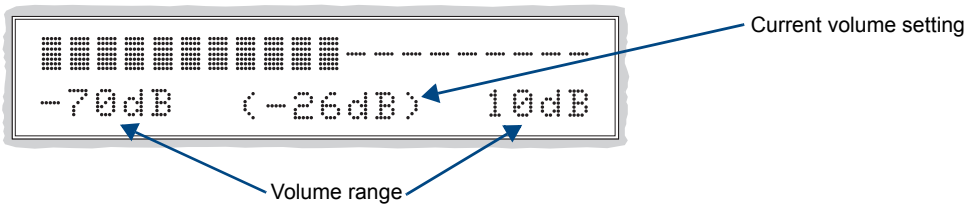


3. Press the Select Key.
   The Adjust Audio submenu appears.

4. Press the Select Key again to choose Output Volume.
   The Control Panel is in Output Volume Mode (all Input Keys are turned off, and the available Output Keys turn blue).



5. Press the Output Key that corresponds to the output to be adjusted.
   The Adjust Volume Screen appears, displaying the volume range of the audio board and the current volume setting for the selected output.



6. Adjust the volume by turning the Control Dial.
   The volume audibly adjusts as you turn the Control Dial.
7. Select another output to adjust.
   Or
   Press the Cancel Key to return to the Adjust Audio submenu.
   Or
   Press the Function Key to return to the Function menu.

Note: *If the selected output is muted, "Muted" displays as the current setting. Turning the Control Dial will un-mute a muted output and adjust the Volume. To reapply mute, see the next page).*

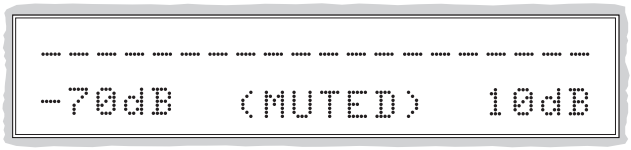


FIG. 39 Example of muted output in Output Volume Mode

Muting and Un-Muting Outputs

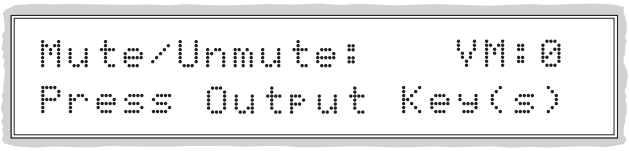
This feature works only for enclosures that support volume control linked to the Epica DGX 16 or 32.

Note: *The mute/un-mute option applies to output volume only and is not available for input gain.*

To mute an output:

1. Press the Function Key.
   The Function menu appears.
2. Locate Adjust Audio by scrolling with the Control Dial.
3. Press the Select Key to enter the selection.
   The Adjust Audio submenu appears.
4. Scroll to Mute/Unmute.

5. Press the Select Key.
   The system is in Mute Mode (all Input Keys are turned off; the available Output Keys turn blue), and any muted Output Keys turn white.



6. Press the Output Key that corresponds to the output to be muted.
   The output is muted, and the Output Key turns white.
7. Select another output to mute.
   Or
   Press the Cancel Key to return to the Adjust Audio submenu.
   Or
   Press the Function Key to return to the Function menu.

To un-mute an output while in Mute Mode:

1. Press the muted (white) Output Key.
   The output is un-muted, and the Output Key turns blue.

Adjusting Digital Input Gain

If an Epica DGX 16 or 32 is linked to an enclosure that supports input gain control, adjustments (within the gain range for the specific audio input board) can be made at any time during normal operation. When audio is adjusted for a device on one virtual matrix, the adjustment remains in effect for that device on all virtual matrices switching audio signals.

Caution: *We strongly recommend that digital input gain adjustments be made only be a qualified dealer or installer.*

Purpose and Use of Input Gain

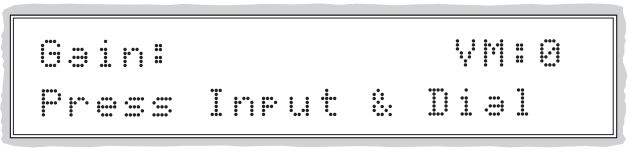
The purpose of controlling input gain (the nominal level of the signal from the source device) is to allow source signals of various amplitudes to be equalized before they are routed and the volume is adjusted. Equalizing source levels provides a consistent reference for volume adjustments and eliminates jumps when routing a new source to a destination.

Typical uses for input gain adjustment include switching consumer and professional grade audio equipment (whose levels can vary noticeably) in the same matrix switcher. Input gain adjustment is also used for equalizing amplitudes between balanced and unbalanced source inputs.

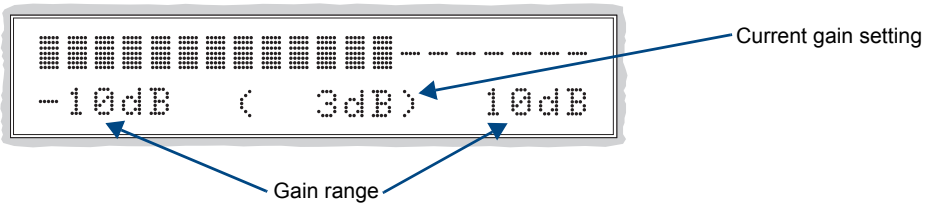
To adjust input gain (including adjusting input gain to equalize input levels):

1. If adjusting input gain to equalize input levels – Route a source (input) to the desired destination (output).
2. Press the Function Key.
   The Function menu appears.
3. Locate Adjust Audio by scrolling with the Control Dial.
4. Press the Select Key to enter the selection.
   The Adjust Audio submenu appears.
5. Scroll to Input Gain.

6. Press the Select Key.
   The system is in Input Gain Mode (the available Input Keys turn blue; all Output Keys are turned off).



7. Press the Input Key that corresponds to the input to be adjusted.
   The Adjust Input Gain Screen appears, displaying the gain range of the audio board and the current gain setting.



8. Adjust the input gain by turning the Control Dial.
   The gain audibly adjusts as you turn the Control Dial.
9. If adjusting input gain to equalize input levels – Repeat Steps 7 and 8 for *all* sources that will be routed to the same destination.
   Or
   If adjusting input gain for a single input – Repeat Steps 7 and 8 for the desired input.
10. Press the Cancel Key to return to the Adjust Audio submenu.
    Or
    Press the Function Key to return to the Function menu.

Locking and Unlocking

Locking the Epica DGX 16 or 32 Control Panel prohibits access to the system and can prevent accidental switching. While the panel is locked, BCS commands still work; however, they cannot be used to unlock the panel. The panel remains locked if the power is cycled.

The password used to lock and unlock the panel consists of a sequence of five input keys. The factory default password is the first five Input Keys (1-2-3-4-5). A new password can be set using any combination of five keys from Input 1 through Input 8 (for instructions, see page 76).

Caution: *We strongly recommend recording passwords in a secure place; Epica DGX 16 and 32 systems cannot retrieve a lost password.*

If the password is lost while the system is locked, contact technical support (see page 42).

Locking the Control Panel

If you enter the wrong password while attempting to lock the Control Panel, the LCD displays “Invalid Password” and the Cancel Key flashes. Press the Cancel Key to clear the error and enter the correct password.

Note: *For security purposes, the Input Keys do not turn white when pressed while locking and unlocking the panel.*

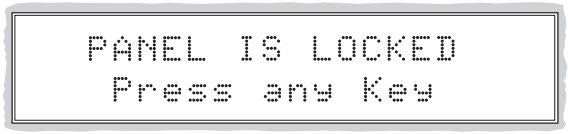
To lock the Control Panel:

1. Press the Function Key.
   The Function menu appears.

2. Locate Lock Panel by scrolling with the Control Dial.

3. Press the Select Key.
   The system is in Lock Mode (Input Keys 1 through 8 turn blue).
4. Press the Input Keys in the following order: 1, 2, 3, 4, 5 (default password).

The panel is locked, and all Input and Output Keys turn off.



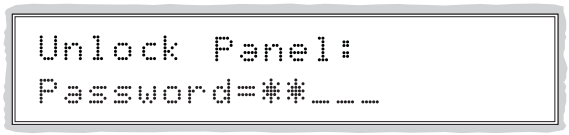
Unlocking the Control Panel

When the panel is locked and you press any key, the Unlock Panel Screen appears. You have ten (10) seconds to enter the password or the Control Panel remains locked. If you wait longer than 10 seconds, press any key again before entering the password.

If you enter the wrong password while attempting to unlock the Control Panel, an invalid password message appears and the Cancel Key flashes. Press the Cancel Key to clear the error and enter the correct password.

To unlock the Control Panel:

1. Press any key.
   The Unlock Panel Screen appears (Input Keys 1 through 8 turn blue).
   You *must* enter the password within ten (10) seconds.



2. Press the Input Keys in the following order: 1, 2, 3, 4, 5 (default password).
   The panel unlocks and returns to the Function menu.

Setup Options

The following options are available under the Setup Options submenu:

- **Software Version** – to display software version information for the Control Panel
- **Default VM** – to change the factory default virtual matrix
- **Reload Config** – is not used in normal operations; use only when loading local presets to the Control Panel or when directed to do so by technical support
- **Change Password** – to change the password from the factory default

Software Version

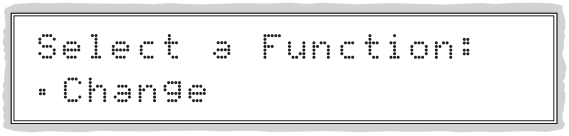
The Software Version Screen provides the following information:

- **Driver** – Control Panel's firmware version
- **Built** – date the Control Panel's software was built
- **Host** – software version of the initial operating system (IOS) for the Control Panel
- **XNet ID** – Control Panel's XNNet device number

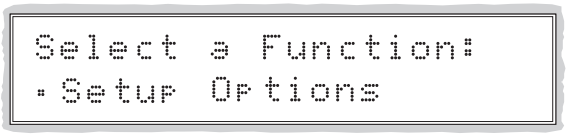
Use the following steps to check the software version information for the Epica DGX 16 or 32 Control Panel.

To check the software version information:

1. Press the Function Key.
   The Function menu appears.

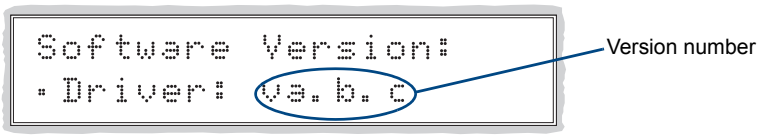


2. Locate Setup Options by scrolling with the Control Dial.



3. Press the Select Key.
   The Setup Options submenu appears.
   Locate Software Version by scrolling with the Control Dial.

4. Press the Select Key again to choose Software Version.
   The Software Version Screen appears.



5. Scroll with the Control Dial to see additional Software Version information.
6. Press the Cancel Key to return to the Setup Options submenu.
   Or press the Function Key to return to the Function menu.

Default Virtual Matrix

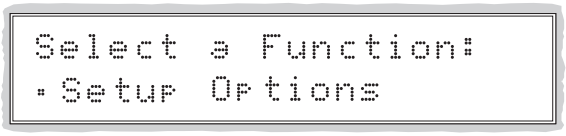
The factory default virtual matrix for the Epica DGX 16 and 32 is VM 0. You have the option of changing the factory default virtual matrix for your system. When you choose a new default virtual matrix, the system will revert to that virtual matrix each time the system is powered up even if you changed the virtual matrix using the V.Matrix list during normal operation. The power *must* be cycled before the default virtual matrix changes are implemented. If you want to immediately switch on the default matrix, either change the current virtual matrix (see page 62) or cycle the power.

The following example changes the default virtual matrix from VM 0 to VM 2, a custom virtual matrix.

To change the default virtual matrix:

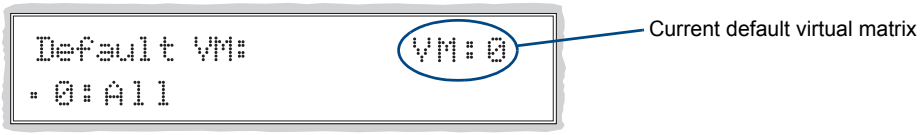
1. Press the Function Key.
   The Function menu appears.

2. Locate Setup Options by scrolling with the Control Dial.



3. Press the Select Key.
   The Setup Options submenu appears.

4. Scroll to Default VM.
   Press the Select Key.
   The Default VM list appears.



5. Scroll to 2:Custom.

6. Press the Select Key.
   The display returns to the top of the Setup Options submenu.
7. Cycle power to implement VM 2 as the default virtual matrix.
   Or change the virtual matrix (see page 62) to immediately execute operations on the new default virtual matrix without cycling power. (The next time power is cycled, VM 2 will be implemented as the default virtual matrix.)

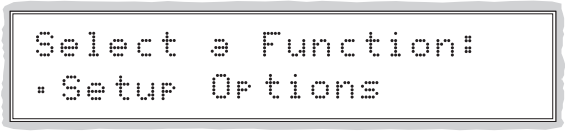
Reload Config

The Reload Config option is not used in normal operations. Use this option only when loading local presets to the Control Panel (or when directed to do so by technical support).

To reload the configuration file to the Control Panel:

1. Press the Function Key.
   The Function menu appears.

2. Locate Setup Options by scrolling with the Control Dial.



3. Press the Select Key.
   The Setup Options submenu appears.
4. Scroll to Reload Config.

5. Press the Select Key.
   The configuration file reloads to the Control Panel and the display returns to the top of the Setup Options submenu.
6. Press the Function Key to return to the Function menu.

Setting the Password

The Epica DGX 16 and 32 Control Panel's default password is "1 2 3 4 5" entered using the first five input keys. A new password can be set using any combination of five of the Input Keys 1 through 8 when the LCD displays "Enter New PWD" (Step 5 in the following procedure). In the Change Password Mode (selected in Step 4), the keys available to use in a password will illuminate blue.

If a password has been created and downloaded to the system from XNConnect, a new password can be set from the front panel to replace it; however, the previous one must be entered first.

Caution: *We strongly recommend recording the new password in a secure place; an Epica DGX 16 or 32 system cannot retrieve a lost password.*

If the password is lost while the system is locked, a new password can be set and downloaded to the system using XNConnect (see page 121).

To set the password:

1. Press the Function Key.
The Function menu appears.

```
Select a Function:
▪Change
```

2. Locate Setup Options by scrolling with the Control Dial.

```
Select a Function:
▪Setup Options
```

3. Press the Select Key.
The Setup Options submenu appears.
Locate Change Password by scrolling with the Control Dial.

```
Setup Options:
▪Change Password
```

4. Press the Select Key.
The LCD displays the prompt Enter Current PWD.
Using the illuminated keys, input the current password. (The default password is 1 2 3 4 5.)

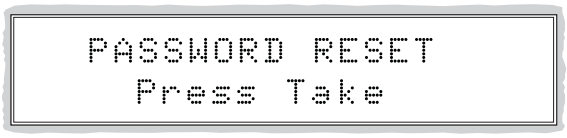
```
Enter Current PWD:
Password=_____
```

5. The LCD displays the prompt Enter New PWD.
Using any combination of the illuminated keys, input the new password.
(To change any entries, press the Cancel Key – restarting the process – and reenter from the start.)

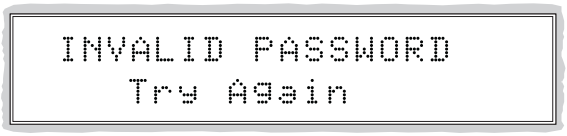
```
Enter New PWD:
Password=_____
```

The LCD displays Reenter New PWD.

6. Re-enter the new password.
   If the re-entered password matches, the system accepts it as the new password, and the LCD displays Password Reset. Press the Take Key and go to Step 7.



   Or
   If the re-entered password does not match, the LCD displays Invalid Password. Press the Cancel Key to return to Enter New PWD screen and repeat Steps 5 and 6.



7. When the new password is successfully reset, press the Cancel Key to return to the Setup Options submenu.
   Or
   Press the Function Key to return to the Function menu.

System Error Codes and Troubleshooting

This section provides an overview of the most common error codes that may appear on an Epica DGX 16 or 32 Control Panel. The table on the next page lists the error code, the name of the code, the meaning of the code, and some basic troubleshooting strategies (additional error code troubleshooting strategies are included on page 78). The codes in the table are not intended to be comprehensive. If an error code appears that is not listed, note the specific number and contact technical support (see page 42).

The first letter of the error code indicates the following:

- E = Error
- W = Warning
- A = Alarm* (requires immediate attention)
- I = Information*

* Because these codes very rarely appear, they are not included in the table.

For the following instructions, open HyperTerminal (or other terminal emulation program) on a PC; see page 29.

To enable error code reporting:

1. Enter `$ERR=1!`
   The system responds with a V.

Note: *If the power is cycled after this procedure, you will need to enable error code reporting again.*

To turn off error code reporting:

1. Enter `$ERR=0!`

Most Common System Error Codes			
Error Codes	**Name**	**Meaning**	**Basic Troubleshooting Strategies**
E01000A	Enclosure timeout error	One or more of the enclosures in a multiple-enclosure system did not acknowledge a control operation command.	• Resend the command. • Check the Status LED on the rear of each enclosure. If any are red, contact technical support. • Check the power indicators. • Check the link connections between enclosures.
EFF8002	Enclosure timeout error	The operation was not completed before the timer expired.	• Resend the command. • Check the power indicators. • Check the link connections in multiple-enclosure systems. • Check that the command was sent using the correct virtual matrix.

Error Code Troubleshooting

Error codes can appear either on the Control Panel LCD or in a terminal emulation program, such as HyperTerminal.

When you are using a Control Panel, one of the most common troubleshooting strategies is to resend the command to see if the error was simply a timeout error.

When you are using BCS commands, one common troubleshooting strategy is to enter the command again. Often the command has simply been entered incorrectly (e.g., omitting an output in a Change command). In other cases, the command has specified a value that is not valid (e.g., a global preset number that does not correspond to a defined global preset).

If the error code persists after correcting and resending the command, contact technical support (see page 42).

NXB-AP-1000 Interface – Initial Setup by Network Admin

Overview

Applicability Notice

The information in this chapter covers the NXB-AP-1000 interface v1.0.0.1.

Important: *If you have not already done so, see the installation instructions for the TCP/IP to LAN connection (page 42).*

When the NXB-AP-1000 interface is accessed, the NXB-AP-1000 delivers HTML pages for setting up the system and a Java control applet, which allows for remote control of an AMX AutoPatch Routing System using PC-based Internet browsing software. The interface can also function as a Tunneling Access Point (TAP).

Note: *A single PC can access multiple AMX AutoPatch Routing Systems, as long as each system has TCP/IP capability; each NXB-AP-1000 interface must be assigned a unique IP address. Furthermore, each system can contain multiple enclosures, as long as it is configured as a single system.*

The NXB-AP-1000 interface information is divided into three chapters.

This chapter provides NXB-AP-1000 interface setup information for the Network Administrator doing the initial setup or ongoing server maintenance. It includes information on:

- Determining the IP address
- Opening the NXB-AP-1000 interface
- Navigating the NXB-AP-1000 interface
- Getting a DHCP IP address (default)
- Setting a static IP address (optional)
- Configuring a connection to a NetLinx Master
- Handling security issues
- Executing a test switch with the XBar controller
- Customizing the XBar controller
- Editing the Clock Manager Settings
- DoD Security mode and ICSP support

The next NXB-AP-1000 chapter, "NXB-AP-1000 Interface – Controlling an Epica DGX 16 or 32," contains complete instructions for the person controlling an Epica DGX 16 or 32 through the NXB-AP-1000 interface after the setup is complete.

The third NXB-AP-1000 chapter, "NXB-AP-1000 Interface – Additional Info for Network Admin," covers the advanced topics of upgrading the firmware, embedding the XBar applet, and changing the proxy setting.

Caution: *We strongly recommend a Network Administrator set up the system even if DHCP (Dynamic Host Configuration Protocol), gateways, firewalls, etc. are not being used.*

System Requirements

- Web browser (Internet Explorer 7.0 or Firefox 3.6.8, etc.)
- JRE v1.4.x or greater (Java Plug-in for the XBar Controller)

Note: *The instructions in this chapter assume that the Epica DGX 16 or 32 is connected to a LAN and receiving power.*

Determining IP Address for NXB-AP-1000 Interface

The Epica DGX 16 and 32 both feature a built-in zero-configuration networking client that allows you to determine the unit's IP address for the NXB-AP-1000 interface via *Bonjour for Windows*® or a similar zero-configuration client. Zero-configuration (or zeroconf, also known as "Bonjour") technology provides a general method to discover services on a local area network. In essence, it allows you to set up a network without any configuration.

Note: *If you are not using NetLinx Studio, contact your Network Administrator for the IP address.*

Accessing Zero-Config Information in the NetLinx Studio WebConsole

To determine the DHCP IP address that the network assigned to the Epica DGX 16 or 32 when the LAN connection was established, you can access the unit via the Zero-Config feature in NetLinx Studio.

The NetLinx Studio version 3.0 (or higher) features a "Zero-Config" tab in the Workspace window. This tab provides Zero-Config networking functionality within NetLinx Studio.

Note: *Refer to the NetLinx Studio online help for details on using Zero-Config.*

The following assumes that the NXB-AP-1000 interface connection (TCP/IP port) is to the same LAN as the PC running NetLinx Studio and the NetLinx Master for the Epica DGX 16 or 32.

To determine the IP address by accessing the NXB-AP-1000 via Zero-Config:

1. In NetLinx Studio (v3.0 or higher), left-click the Zero-Config tab on the Workspace Bar to open the tab.

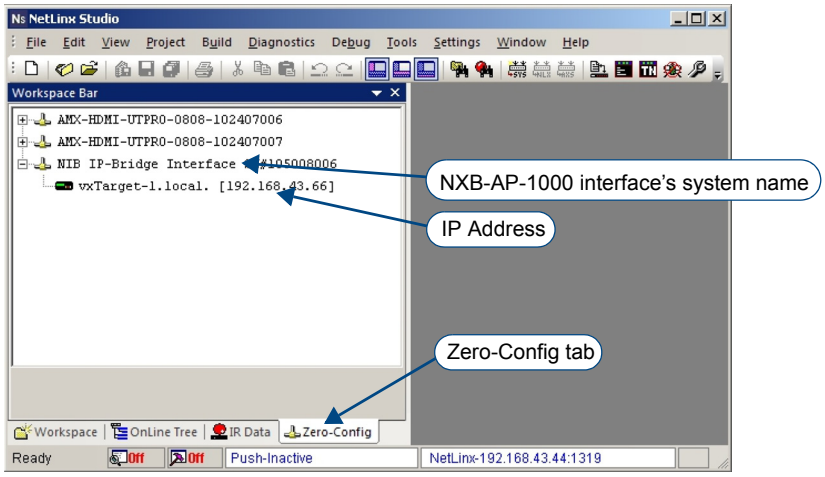


FIG. 40 NetLinx Studio showing the Zero-Config tab and the IP address for an NXB-AP-1000 interface

2. Right-click anywhere in the Workspace and select Refresh Zero-Config List to generate an initial listing of all Zero-Config devices that have been detected (FIG. 40).
3. Click the plus symbol (+) to the left of the "NIB IP-Bridge Interface" (the NXB-AP-1000 interface for the Epica DGX 16 or 32) in the Zero-Config list to expand its information.

The NXB-AP-1000 interface's current IP Address is listed below its system name of "NIB IP-Bridge Interface."

Opening the NXB-AP-1000 Interface

Caution: *We strongly recommend that the NXB-AP-1000 interface site be placed inside your network firewall and that system security be turned on.*

To open the NXB-AP-1000 interface:

1. **From the NetLinx Studio Zero-Config tab** – Double-click on "NIB IP-Bridge Interface" or right-click and select one of the launch browser options. (If the "NIB IP-Bridge Interface" is not displayed, see the instructions on the previous page.)
   The NXB-AP-1000 Home page opens (FIG. 41).
   Or
   In the address bar of your PC's browser – Type the IP address and press Enter (to determine the IP address, see the instructions on the previous page or contact your Network Administrator).
   The PC must be on the same subnet (e.g., 192.168.X.X).
   The NXB-AP-1000 Home page opens (FIG. 41).

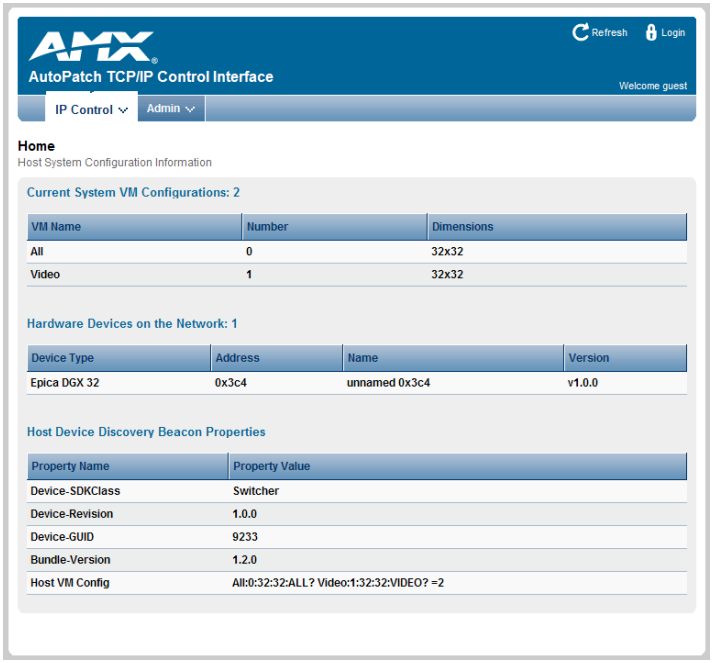


FIG. 41 NXB-AP-1000 Home page shows system configuration information (Epica DGX 32 example)

2. Complete any necessary configuration of the NXB-AP-1000 interface. Instructions are included in this chapter.

If the Home page does not open, see the "NXB-AP-1000 Troubleshooting" section on page 46.

Navigating the NXB-AP-1000 Interface

The NXB-AP-1000 interface has two drop down menus: IP Control and Admin. These menus access all the control, configuration, preferences, and settings pages in the interface. The menu options are shown in FIG. 42 and FIG. 43. In addition, some pages have tab options as well (see FIG. 45 on page 84).

IP Control Menu - Options for the IP Control Pages in the Interface

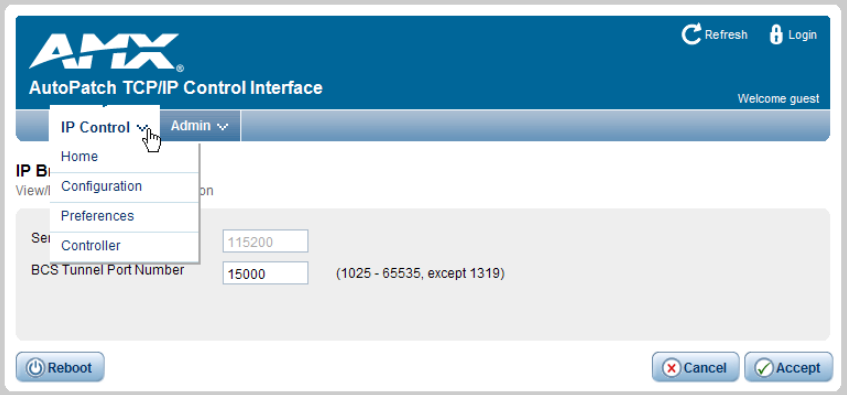


FIG. 42 IP Control drop down menu options

Admin Menu - Options for the Configuration Manager Pages in the Interface

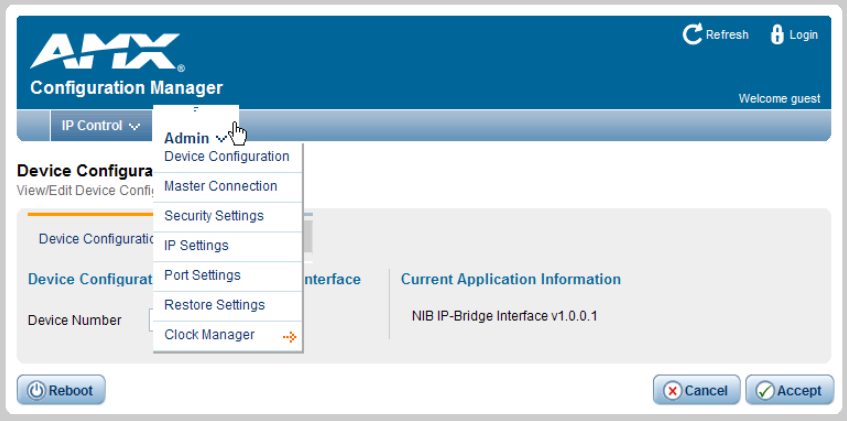


FIG. 43 Admin drop down menu options

Getting a DHCP IP Address

By default, the NXB-AP-1000 interface is set to use a DHCP (Dynamic Host Configuration Protocol) IP address (a connection must be established with a network that contains a DHCP server). If the IP address has been changed to a static IP address and you want to change back to a DHCP IP address, use the following directions.

To force invocation of a DHCP IP address:

1. From the Admin drop down menu, select IP Settings.
2. If DHCP is not selected, click to enable.
3. Click Accept.
4. Click Reboot. The NXB-AP-1000 interface begins searching for a DHCP server. If the search times out, the address will revert to the previous IP address.

Important: *Any time you click "Reboot" from any page in the NXB-AP-1000 interface, the server reboots. The reboot updates information between the Epica DGX 16 or 32 and the server. (The Epica DGX 16 or 32 system itself does not reboot).*

Setting a Static IP Address

The current IP address is displayed on the IP Settings page.

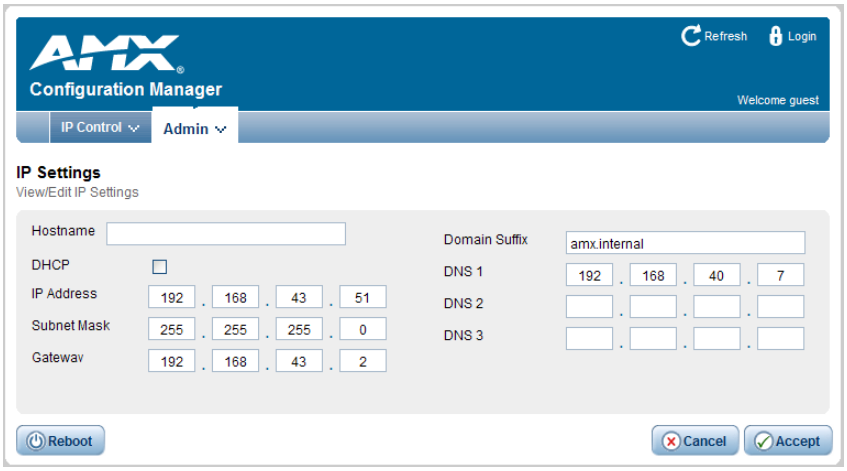


FIG. 44 IP Settings page

Note: *When the DHCP setting is selected and you power the system down and then power back up, the DHCP server will reassign the IP address, which may or may not be the same address it assigned previously. Setting a static IP address prevents the possibility of the IP address changing at power up.*

To enter a static IP address:

1. From the Admin drop down menu, select IP Settings.
2. If DHCP is selected, click to disable.
3. Enter the static IP address in the IP Address field.
4. Click Accept.
5. Click Reboot.

Important: *Any time you click "Reboot" from any page in the NXB-AP-1000 interface, the server reboots. The reboot updates information between the Epica DGX 16 or 32 and the server.*

Configuring a Connection to a NetLinx Master

One of the main features of the NXB-AP-1000 interface is that it allows you to make various configuration settings via a web browser on any PC, including those with access to a NetLinx Master.

The instructions on the next page assume all of the items below have been completed:

- An active connection between the TCP/IP port on the Epica DGX 16 or 32 and the LAN has been established (see page 42).
- The NXB-AP-1000 interface connection (TCP/IP port) is to the same LAN as the PC running NetLinx Studio and the NetLinx Master for the Epica DGX 16 or 32.
- The IP address for the NXB-AP-1000 interface has been determined (see page 80).
- The NXB-AP-1000 interface is open (see page 81).

Connecting to a NetLinx Master

To establish communication between an Epica DGX 16 or 32 and a NetLinx Master:

1. From the Admin drop down menu, select Master Connection.

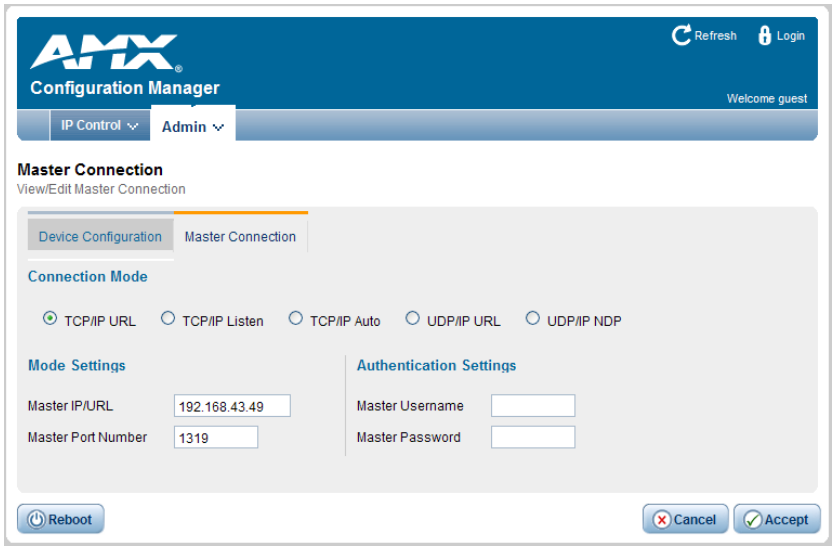


FIG. 45 Master Connection page

2. Optional – Under Connection Mode, select one of the options (default = TCP/IP URL).
3. Under Mode Settings, enter the Master's IP/URL in the Master IP/URL text field.

Important: *Do not change the default Master Port Number assignment of 1319 (unless the master has been configured to use a different port).*

4. If the NetLinx Master has Authentication enabled – Under Authentication Settings, enter the Master Username and Master Password.
5. Click Accept to save the changes.
6. Click Reboot to reboot the Epica DGX 16 or 32 connection. Once rebooted, the matrix switcher is in communication with the NetLinx Master, as indicated by steady a blink on the enclosure's NXB-AP-1000 Status LED to the left of the TCP/IP port.

Important: *Any time you click "Reboot" from any page in the NXB-AP-1000 interface, the server reboots. The reboot updates information between the Epica DGX 16 or 32 and the server. (The Epica DGX 16 or 32 system itself does not reboot).*

Note: *For information on using NetLinx Studio, see the NetLinx Studio online Help and the "NetLinx Integrated Controllers WebConsole & Programming Guide" at* ***www.amx.com****.*

Handling Security Issues

From the NXB-AP-1000 interface, you can enable or disable security access to web server control of the Epica DGX 16 or 32 system.

If tight security is required, we recommend that the following security measures be followed:

- Enable/Disable the security settings and login information as part of the initial setup (see below).
- Place the server site inside your network firewall.
- Deploy the NXB-AP-1000 interface in a secure LAN environment.
- Enable the DoD mode setting on the NetLinx Master (see the NetLinx documentation).
- Lock the front Control Panel (see page 72).
- If extra precaution is necessary, lock the enclosure(s) in a secure location.

Setting Security Settings

From the Admin drop down menu, select Security Settings to open the Security Settings page (FIG. 46). Use the options on the page to specify security settings and login information for the Epica DGX 16 or 32.

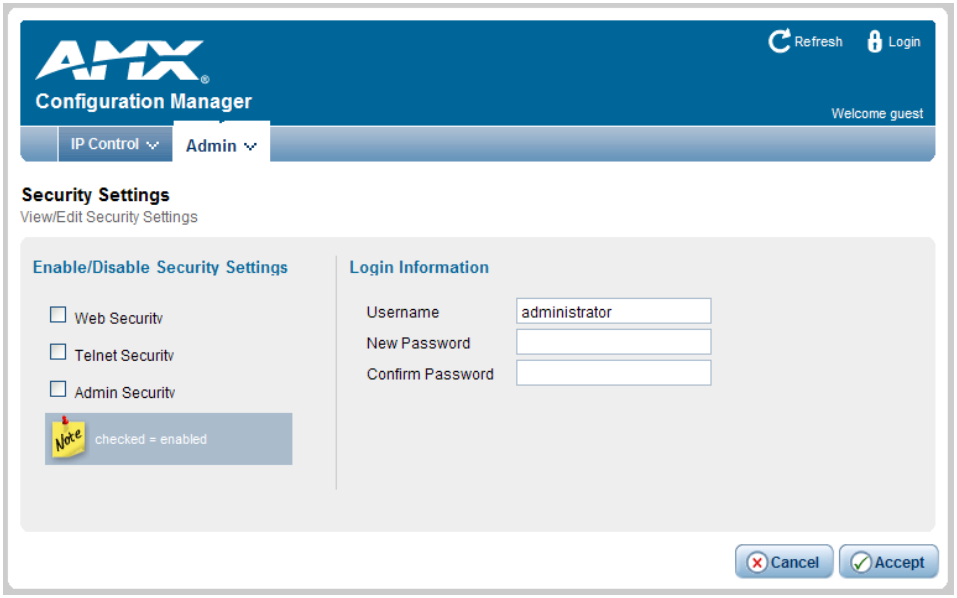


FIG. 46 Security Settings page

Click the appropriate check box(es) to enable specific types of security (if one or more are selected, Login Information is required). The default for each of the Security Settings is “disabled.”

Enable/Disable Security Settings	
Setting	**Resulting Restrictions**
Web Security	When Web Security is enabled, a username and password are required to access any system Web pages.
Telnet Security	When Telnet Security is enabled, a username and password are required to establish a Telnet or SSH connection.
Admin Security	When Admin Security is enabled, a username and password are required to modify any system configuration item.

Note: *If you enable a Security Setting and then click Accept without specifying Login Information, the login defaults apply (see below).*

Setting Login Information

The Login Information settings are required only if one or more of the security settings are enabled.

To set the login information:

1. **Username** – Enter the Username that will be required to log into the system if security is enabled. The default Username is **administrator**.
2. **New Password** – Enter a new password that will be required to log into the system if security is enabled. The default Password is **password**.
3. **Confirm Password** – Re-enter the new password in this field.
4. Click Accept to save the changes (or click Cancel to cancel the changes).
   The changes take effect immediately.

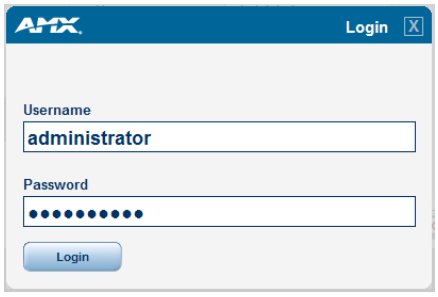
Note: *If the Security Settings are disabled and then enabled again, the Login Information remains in affect.*

Login when Security is Enabled

Logging into pages in the interface is a requirement only if the Web Security option and/or the Admin Security option are enabled.

To log into the Configuration Manager when security is enabled:

1. Click the Login link in the upper-right corner of any page.
   The Login dialog box opens.



2. Enter the login information specified during security setup (see above).
   - Default Username = administrator
   - Default Password = password
3. Click the Login button.

Executing a Test Switch with the XBar Controller

The NXB-AP-1000 interface includes access to the XBar Controller for executing and disconnecting switches on an AMX AutoPatch Routing System.

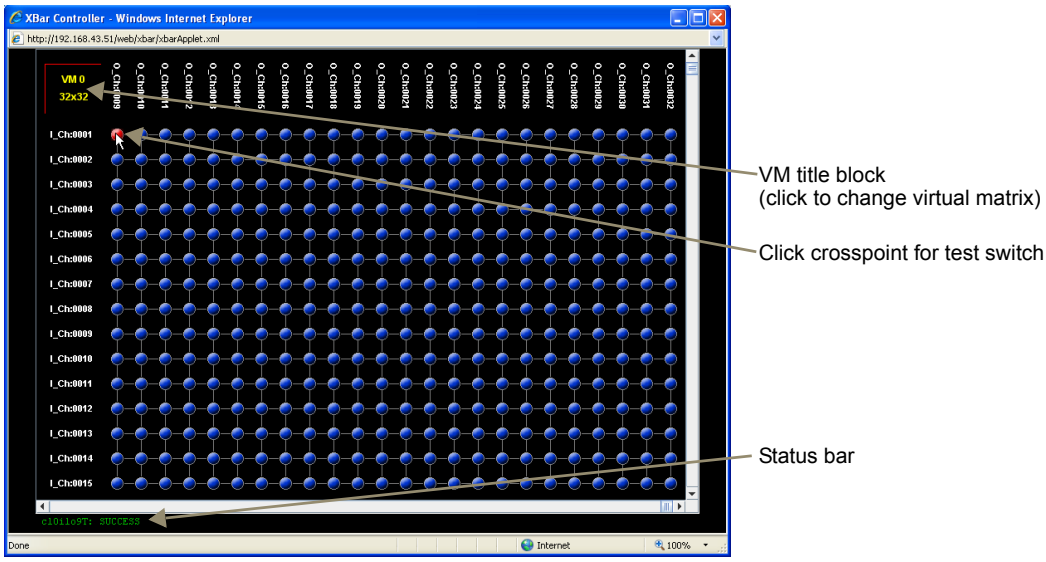
Before executing a test switch, make sure the first source device and the first destination device are connected to the input and output connectors as indicated in the "AutoPatch Connector Guide" that shipped with the system.

Note: *For complete information on the XBar Controller, see page 95.*

The test switch below routes Input 1 (source channel 1) to Output 1 (destination channel 1) on VM 0 (the default virtual matrix for the Epica DGX 16 and 32).

To execute a test switch with the XBar:

1. Install the Java Plug-in* if necessary. (The plug-in is required before the XBar Controller can be used.)
2. From the IP Control drop down menu, select Controller.
   The XBar opens (the example is for an Epica DGX 32).



3. Click the blue crosspoint for routing Input 1 to Output 1.
   (Crosspoints are located at the intersection of the inputs and outputs. Inputs are on the left; outputs are across the top.)
   The blue crosspoint image turns red as the switch is routed; the Status bar displays the BCS (Basic Control Structure) command and "SUCCESS" to indicate the switch was executed.

* The Java Plug-in *must* be installed on your PC before the XBar Controller will work. This free Java software may be downloaded from http//www.java.com. (Administrative login to the PC may be required to install the Java Plug-in.)

To disconnect the test switch with the XBar:

1. Click the red crosspoint. The red crosspoint image turns blue as the test switch is disconnected.

Customizing the XBar Controller

The NXB-AP-1000 interface provides control for an AMX AutoPatch Routing System with the XBar Controller. The XBar displays crosspoints for the input and output channels.

Options for customizing the XBar are:

- Setting the virtual matrix (VM) for XBar control
- Setting the size of the XBar window

The settings for these options are located on the same page (accessible from IP Control drop down menu).

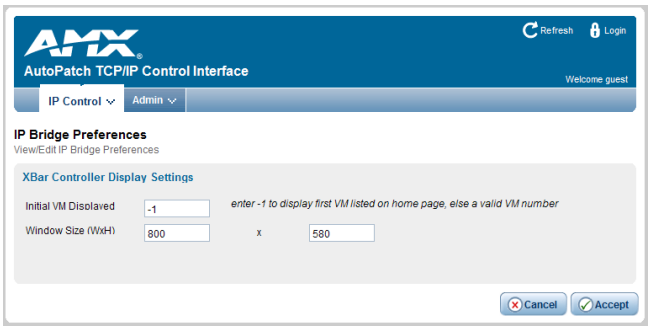


FIG. 47 IP Bridge Preferences page

Setting the Initial VM to Display

The initial virtual matrix (VM) for executing switches can be set. The VM is displayed in the VM title block in the upper left corner of the XBar. The default VM for executing switches that will display for all XBar Controllers that are launched for the system can be specified from NXB-AP-1000 interface.

To set the initial virtual matrix that will display in the XBar:

1. If the XBar is open, close before proceeding.
2. From the IP Control drop down menu, select Preferences.
3. In the Initial VM Displayed field, enter the virtual matrix number (the Epica DGX 16 and 32 normally have two virtual matrices: VM 0 = all; VM 1 = video).

Note: *If you want the default VM to be the first virtual matrix discovered during bootup (no matter what its number), enter a value of* ***-1****.*

4. Click Accept. The next time the XBar is launched, the newly designated default VM will display in the VM title block.

Setting the Size of the XBar Window

The size of the XBar applet can be changed from its default window size of 800x580. The minimum size is 300x300; the maximum size is 2000x2000. You may need to experiment a little to find the optimal display size for your PC.

To set the size of the XBar applet window:

1. If the XBar is open, close before proceeding.
2. From the IP Control drop down menu, select Preferences.
3. In the Window Size fields, enter the desired width and height for the window.
4. Click Accept. The next time the XBar is launched, it will open at the new setting size.

Executing and Disconnecting Switches

The NXB-AP-1000 interface provides the XBar Controller for executing and disconnecting switches on an AMX AutoPatch Routing System. For complete information, see the "NXB-AP-1000 Interface – Controlling an Epica DGX 16 or 32" chapter on page 95.

Editing the Clock Manager Settings

The NXB-AP-1000 interface provides a Clock Manager (accessible from the Admin drop down menu) for selecting the current mode of the system time. Be sure to click Accept to save your changes. The changes take effect immediately.

Clock Manager - Mode Manager

Time Sync Settings

- **Standalone** – when this option is selected, the settings are modified on the same page. Be sure to click Accept after clicking Standalone and again after modifying settings.
- **Network Time** – this option *must* be selected before the Daylight Saving tab and the NIST Servers tab are enabled. Their settings are modified on separate pages. Be sure to click Accept after clicking Network Time and again after modifying settings.

To modify Standalone settings in the Clock Manager:

1. From the Admin drop down menu, select Clock Manager (or select Mode from the Clock Manager submenu).

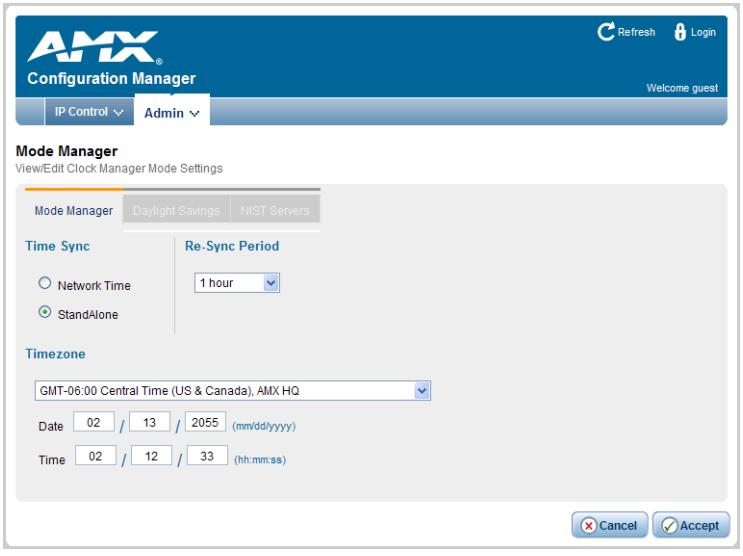


FIG. 48 Mode Manager page

2. Under Time Sync, select Standalone and click Accept.
3. Modify any of the settings under Re-Sync Period and Timezone and click Accept.

When Network Time is selected (*must* click Accept), the Daylight Saving tab and the NIST Servers tab become available; their settings are modified on separate pages.

Note: *If using the Standalone mode, the time will be valid only until the matrix switcher is rebooted. Once the matrix switcher is rebooted, the time will be lost and will need to be reset.*

Clock Manager - Daylight Savings (only available if Network Time is selected)

To adjust Daylight Savings settings in the Clock Manager:

1. From the Admin drop down menu, select Clock Manager (or select Mode from the Clock Manager submenu).
2. Under Time Sync, select Network Time and click Accept.
3. Click the Daylight Savings tab.

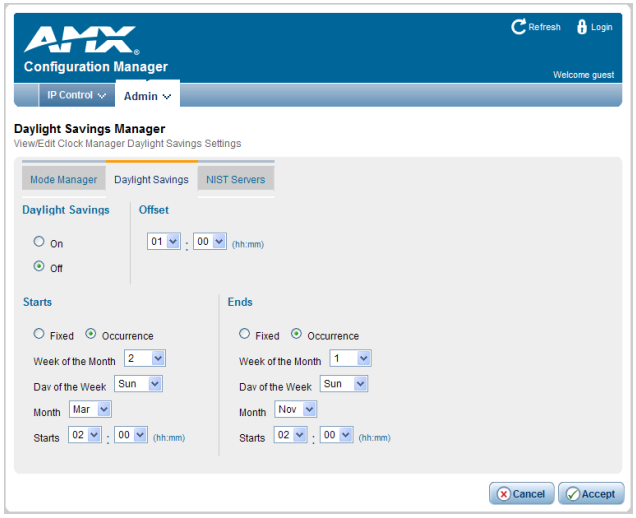


FIG. 49 Daylight Savings Manager page

4. Modify any of the settings on the Daylight Savings page and click Accept.

Clock Manager - NIST Servers (only available if Network Time is selected)

To adjust NIST Servers settings in the Clock Manager:

1. From the Admin drop down menu, select Clock Manager (or select Mode from the Clock Manager submenu).
2. Under Time Sync, select Network Time and click Accept.
3. Click the NIST Servers tab.

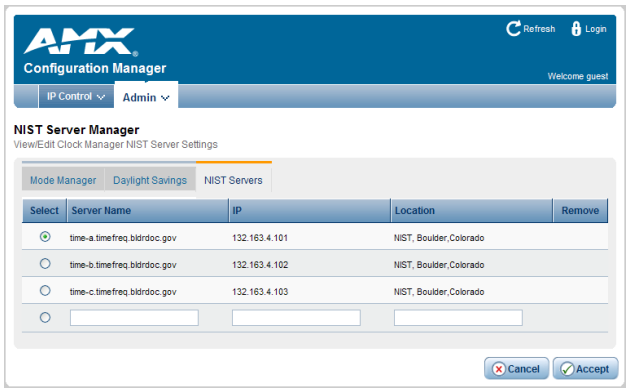


FIG. 50 NIST Server Manager page

4. Modify any of the settings on the NIST Servers page and click Accept.

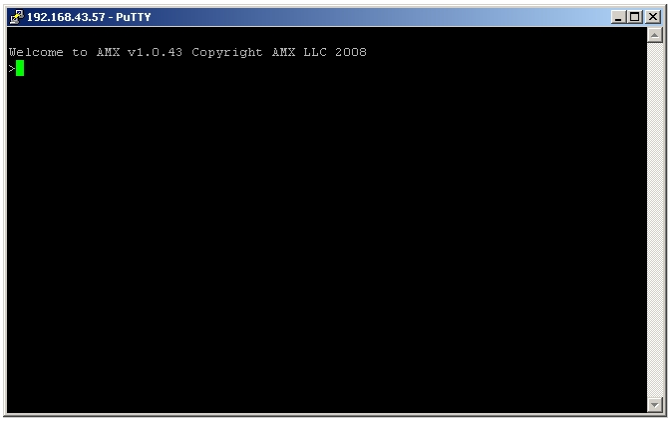
DoD Security Mode

Epica DGX 16 and 32 matrix switchers provide a DoD Security mode (for security profile settings, see the table on page 93).

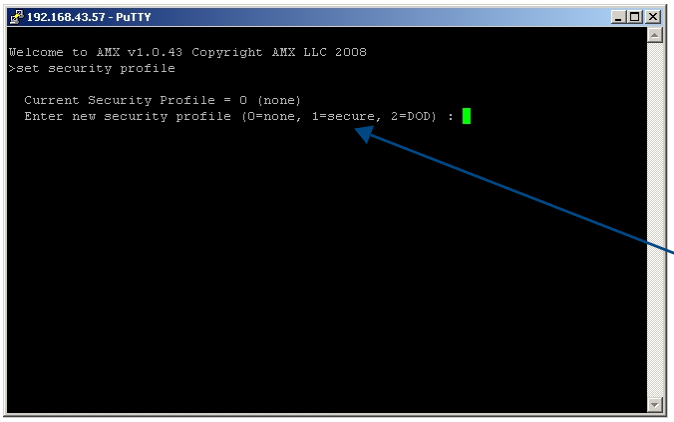
Important: *When DoD Security mode is "on" a BCS tunnel is available; however, the NXB-AP-1000 interface is unavailable.*

To enable DoD Security mode for an Epica DGX 16 or 32:

1. Insert one end of an RJ-45 cable into a network card on a PC.
2. Insert the other end of the cable into the TCP/IP port on the enclosure.
3. Open an SSH terminal emulator (e.g., PuTTY); connect to the IP address of the NXB-AP-1000. SSH utilities require a username and password to login.



4. Type `set security profile`.
   A prompt will appear indicating the current setting and the options for the setting.


192.168.43.57 - PuTTY
Welcome to AMX v1.0.43 Copyright AMX LLC 2008
>set security profile
Current Security Profile = 0 (none)
Enter new security profile (0=none, 1=secure, 2=DOD) :

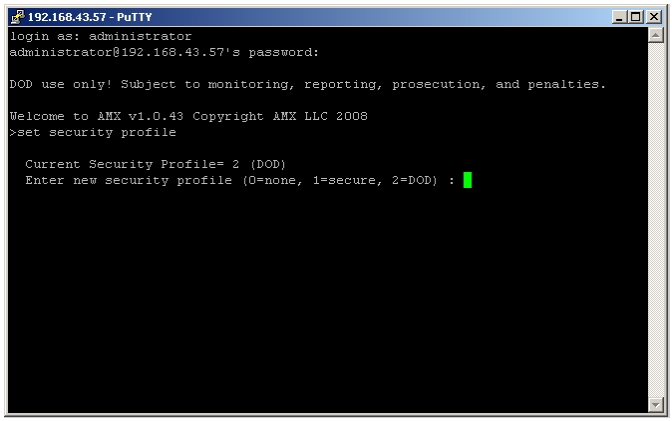
The three security profile settings are described in the table on page 92.

5. To enable DoD Security mode, type `2` and press enter.
   You will be prompted to reboot the system for the new setting to take effect.
6. Type `reboot` and press enter.

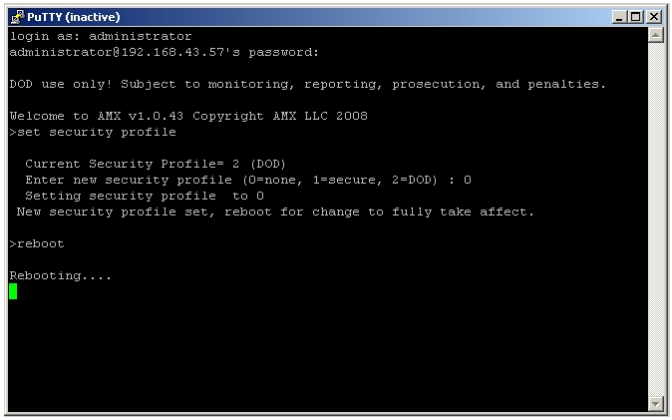
Important: *When the system is in DoD Security mode, the user name automatically changes to* `administrator` *and the password to* `Amx1234!` *The user name and password are case sensitive and can be changed by connecting over SSH, entering* `security setup`*, and following the menus.*

To disable DoD Security mode for an Epica DGX 16 or 32:

1. Insert one end of an RJ-45 cable into a network card on a PC.
2. Insert the other end of the cable into the TCP/IP port on the enclosure.
3. Open an SSH terminal utility (e.g., Putty) and connect to the IP address of the NXB-AP-1000. SSH utilities require a username and password to login (see "Important" note on previous page).


192.168.43.57 - PuTTY
login as: administrator
administrator@192.168.43.57's password:
DOD use only! Subject to monitoring, reporting, prosecution, and penalties.
Welcome to AMX v1.0.43 Copyright AMX LLC 2008
>set security profile
Current Security Profile= 2 (DOD)
Enter new security profile (0=none, 1=secure, 2=DOD) :

4. Type `set security profile`.
   A prompt will appear indicating the current setting and the options for the setting.
5. To disable DoD Security mode, type `0` and press enter.
   You will be prompted to reboot the system for the new setting to take effect.
6. Type `reboot` and press enter.


PuTTY (inactive)
login as: administrator
administrator@192.168.43.57's password:
DOD use only! Subject to monitoring, reporting, prosecution, and penalties.
Welcome to AMX v1.0.43 Copyright AMX LLC 2008
>set security profile
Current Security Profile= 2 (DOD)
Enter new security profile (0=none, 1=secure, 2=DOD) : 0
Setting security profile to 0
New security profile set, reboot for change to fully take affect.
>reboot
Rebooting....

Important: *When the system is taken out of DoD Security mode, the user name and password will not change back to their previous settings. They will remain as* `administrator` *and* `Amx1234!` *or as whatever their values were changed to after the device was put into DoD Security mode.*

The three security profile terminal command settings are described in the table below.

Set Security Profile Settings	
Setting	**Description**
None (default)	• No security is enabled and all interfaces are available, including HTTP, HTTPS, Telnet, SSH, and FTP. • Logins are not required on the NXB-AP-1000 interface or Telnet. • This is the default from-the-factory configuration.
Secure	• Unsecured interface ports are disabled including HTTP, Telnet, and FTP. Only HTTPS and SSH ports are available. • All user access requires a username/password login including HTTPS and SSH. • Passwords must conform to a stricter set of requirements. They must be at least 8 characters long and contain at least one upper and one lower case alpha and one numeric and one special character (excluding the blankspace ‘ ’). • Passwords cannot contain back-to-back duplicate characters. • To make sure all account passwords conform to the new standard, all existing user accounts are deleted and the built-in ‘administrator’ and account passwords are set to the secure default of “Amx1234!”. • Failed login attempts will force a 4 second delay before a subsequent login attempt can occur. • Three consecutive login failures from any location will cause a 15 minute lockout for the specified user account. • All user account access will be timed out after at most 15 minutes of inactivity by the user. Any activity after the time out will cause the login prompt to be displayed and login will be required to regain access. The inactivity timer on an SSH session will be disabled if extended diagnostic logging is active (enable with “msg on” command). • All account access including successful and failed logins and logouts will be recorded in persistent storage. Audit records will be retained for 90 days. The current audit logs can be viewed via SSH sessions using the “show audit log” command. The audit log can be manually cleared from SSH using the “clear audit log” command.
DoD	DoD security profile has all of the security specifications of “secure” profile along with the following additional features: • HTTPS is disabled. • The SSH interface will display the following banner after a successful login: *“DOD use only! Subject to monitoring, reporting, prosecution, and penalties.”* Secure and DoD profile configuration can be tailored with more or less security features by manually altering the system’s configuration following the secure profile selection. For example, the system can be put into “secure” profile and then the HTTP and Telnet interfaces can be manually re-enabled via their existing configuration mechanism. This would enable all of the new security features provided by the “secure” profile but still allow system access via HTTP and Telnet. **Note:** *When transitioning from secure or DoD profile to the “none” profile, user accounts are not wiped and the “administrator” account retains its secure password.*

ICSP Support

When using ICSP protocol, connect to Port 2 of the NXB-AP-1000 interface through the NetLinx Controller for SEND_COMMANDs that include standard BCS commands and connect to Port 3 for any SEND_COMMANDs that include diagnostic or auxiliary BCS commands. Port 1 is reserved for future functionality. For Epica DGX 16/32 NetLinx Programming information, see page 105.

NXB-AP-1000 Interface – Controlling an Epica DGX 16 or 32

XBar Controller Overview

The NXB-AP-1000 Interface includes the option of using an XBar Controller which allows for remote control of Epica DGX 16 and 32 Matrix Switchers using PC-based Internet browsing software.

Opening the XBar Controller

The XBar Controller can be accessed from any page in the NXB-AP-1000 Interface by opening the IP Control drop down menu and selecting Controller.

The directions in this chapter assume the following:

- The Epica DGX 16 or 32 has been connected via the TCP/IP port to a LAN or to a PC (see page 42).
- The NXB-AP-1000 Interface has been accessed (see page 81).

To open the XBar Controller:

1. From any page in the NXB-AP-1000 Interface, open the IP Control drop down menu.

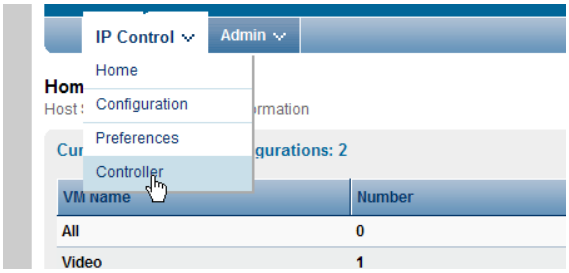


FIG. 51 Access the XBar Controller from the IP Control drop down menu

2. Select Controller.
   The XBar Controller opens.

Executing and Disconnecting Switches with the XBar

The NXB-AP-1000 Interface supports a graphic interface control panel called the XBar Controller. The XBar has crosspoints for executing and disconnecting switches on an AMX AutoPatch Routing System, such as the Epica DGX 16 or 32.

The XBar can control specific parts of the system through virtual matrices (VMs). For example, if the Epica DGX 16 or 32 is linked to another AMX AutoPatch Matrix Switcher that routes audio, the XBar can switch audio-follow-video signals on one VM, video on another, and audio on yet another. (This ability assumes the system has been configured to do so). The VM selected will determine which virtual matrix is being controlled.

Any NXB-AP-1000 Interface for a single system can be accessed from up to five PCs at the same time. The XBar for the system can be operated simultaneously from all of the PCs using the same or different VMs. Simultaneous XBar users can open the VM Selection Pad and update status as needed. Keep in mind that executing switches on one VM may affect the routing state on the other VMs.

Note: *Multiple independent AMX AutoPatch Routing Systems (each with server connection) can be controlled from a single PC. Each NXB-AP-1000 Interface can be assigned a unique IP address. The individual addresses can then be entered as needed in the browser. The IP address displays at the top of the XBar Controller, indicating which XBar you are using.*

Navigating the XBar Controller

The crosspoint images in the XBar's crossbar field represent the intersections of the input channels and the output channels on the matrix switcher (the example below shows an Epica DGX 32).

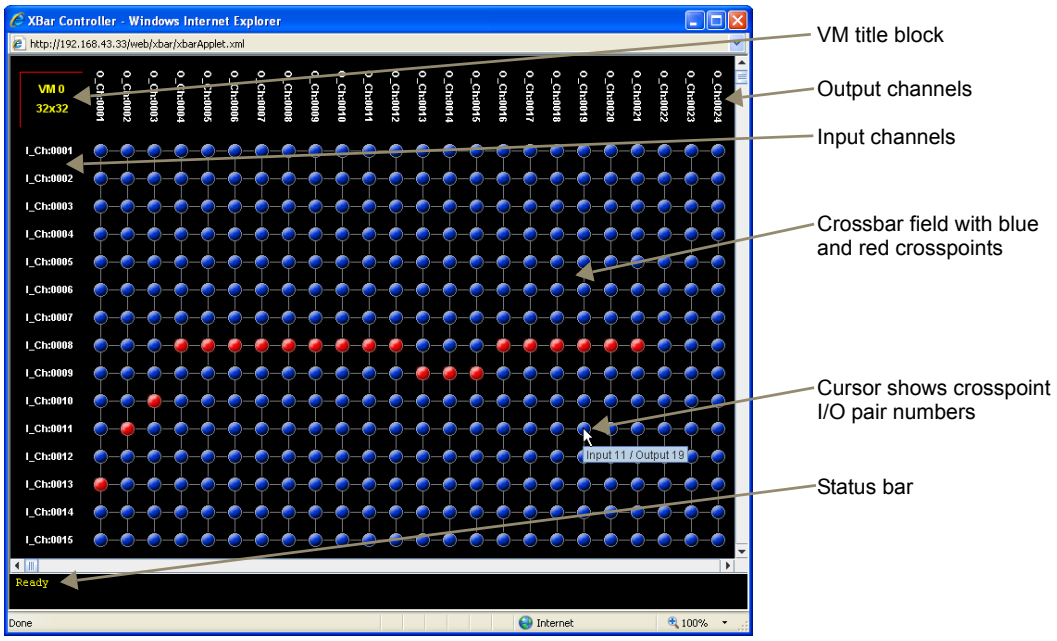


FIG. 52 XBar Controller

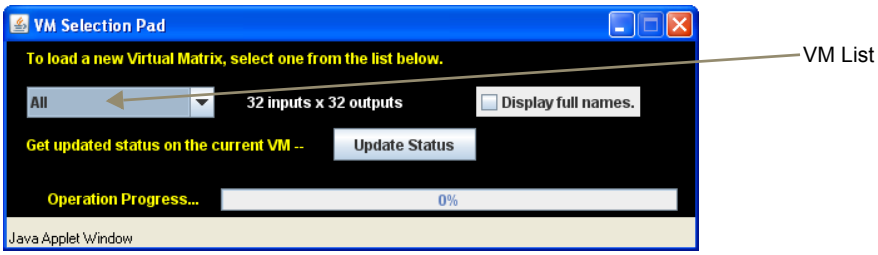
Use the following features to navigate the XBar:

- VM title block – click to open the VM Selection Pad to change the virtual matrix (VM) or update system status.
- Input channels (on left) – indicate the numbers of the source channels.
- Output channels (on top) – indicate the numbers of the destination channels.
- Blue crosspoint – blue indicates that there is no active signal; click to route the signal (the crosspoint will remain blue if the switch is not completed).
- Red crosspoint – red indicates an actively routed signal; click to disconnect the signal.
- Cursor over crosspoint – move the cursor over an I/O pair to display its channel numbers.
- Status bar – as crosspoints are selected and deselected, the Status bar displays the corresponding BCS (Basic Control Structure) command and indicates when the command is successfully executed.

Note: *The VM (virtual matrix) that initially displays in the VM title block is set at the factory to VM 0 (the default). To change the VM, see the next page. To change the initial VM that is displayed every time you open the XBar, see the directions on page 88.*

To execute or disconnect switches on the XBar:

1. Access the XBar using the instructions on page 95.
   The XBar opens.
2. Optional (to change the virtual matrix) – Click the VM title block in the upper left corner.
   The VM Selection Pad dialog box opens.



   From the VM drop down list, select the new virtual matrix.
   Close the VM Selection Pad.
3. Click a blue (inactive) crosspoint to execute a switch.
   The blue crosspoint image turns red as the switch is routed.
   Or
   Click a red (active) crosspoint to disconnect a switch.
   The red crosspoint image turns blue as the switch is disconnected.

Tip: *To select or unselect consecutive crosspoints, hold down the Control key and move the mouse across the desired crosspoints (do not hold down any of the mouse buttons).*

When the XBar is used simultaneously by multiple users or when other control options (such as control panels or external serial controllers) are also being used, system status can be updated from the VM Selection Pad.

To update system status when using multiple control points:

1. Click the VM title block in the upper left corner of the XBar.
   The VM Selection Pad dialog box opens.
2. Click Update Status.
   The most current routing state is displayed.
3. Exit the VM Selection Pad when done.

NXB-AP-1000 Interface – Additional Info for Network Admin

This chapter contains information on upgrading firmware (see below), embedding the XBar applet (see page 100), and changing the proxy setting (see page 101).

Upgrading Firmware

Firmware upgrades for the NXB-AP-1000 Interface on the Epica DGX 16 and 32 are handled via NetLinx Studio using .KIT files.

Before You Start

- Verify you have the latest version of NetLinx Studio on your PC. Use the Web Update option in NetLinx Studio's Help menu to obtain the latest version, or go to **www.amx.com** and log in as a Dealer to download the latest version.
- Verify that the NetLinx Master and the Epica DGX 16 or 32 are on the same network.
- Verify that the NetLinx Master is powered up.
- Determine the Device Number that is assigned to the Epica DGX 16 or 32.
- The Device Number can be viewed/edited in the Epica DGX 16 or 32 Configuration Manager - Device Configuration page.
- Launch NetLinx Studio and open the OnLine Device Tree.

Tip: *Place .KIT files in a local drive for speedy throughput.*

To send firmware upgrade files to the Epica DGX 16 or 32:

1. Select Tools > Firmware Transfers > Send to NetLinx Device.
2. Click the Browse (...) button to navigate to the target directory.
3. From the Files list, select the appropriate .KIT file.
4. Enter the Device and System ID Numbers for the Epica DGX 16 or 32 in the Device and System text boxes.
5. Review the File, Connection, Address, and Target Device information.
6. Click the Send button.

NetLinx Studio transfers the .KIT files and then sends a command to the system to reboot (the box *must* be checked), after which the Epica DGX 16 or 32 goes through the upgrade process.

Upgrade Process

- During the process, the Status LED blinks and the system stays offline.
- Once the upgrade is complete, the Status LED stops blinking and the system comes online.

Caution: *If for any reason the .KIT file transfer fails, continue to retry until the transfer is successful. Do not reboot the system or change the connections until the transfer is complete. Failure to complete the transfer successfully may require factory repair of the Epica DGX 16 or 32.*

Embedding the XBar Applet

The XBar applet can be embedded in a custom website by using the applet tag shown below.

Make any of the following adjustments to the code to fit your particular system's requirements.

- Replace the code base value with the IP address for your system.
- Set the width and height for the display based on the initial virtual matrix size (smaller VMs look fine in a smaller size, while larger VMs require a larger size to minimize scrolling).
- Optional – Specify the "InitialVM" value, or the lowest numbered VM will display by default.
- Optional – Include the "VMLockDown" information if you want to limit control to a particular virtual matrix; otherwise, all virtual matrices will be accessible from the VM title block. Specify "locked" or "unlocked" for the value. The XBar defaults to the unlocked state if this option is not included in the tag.
- Optional – Specify the "AllowGain" value, if you want the input gain adjustment feature enabled. Specify "true" for the value.
- Optional – Specify the "AllowVolume" value, if you want the output volume adjustment feature enabled. Specify "true" for the value.

Important: *If you do not want either or both of the "Allow Gain" and "Allow Volume" options, omit those parameter(s) entirely.*

XBar Applet Tag

```
<HTML>
<BODY>
<!-- Your custom html code goes here. -->
<APPLET code="CrossBar.class" codebase="http://192.168.0.251"
archive="CrossBar.jar" width=400 height=500 >
        <param name = "InitialVM" value = "0">
        <param name = "VMLockDown" value = "locked">
        <param name = "AllowGain" value = "true">
        <param name = "AllowVolume" value = "true">
</APPLET>
</BODY>
</HTML>
```

Changing the Proxy Setting

If the NXB-AP-1000 Interface does not open during setup, try the following troubleshooting strategies:

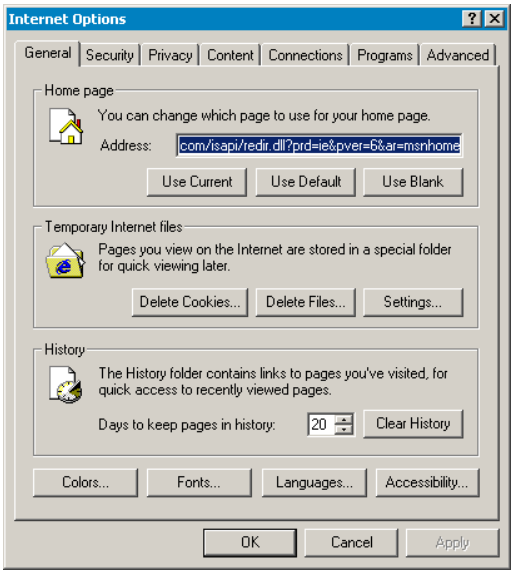
- ❑ Check all power, signal, and link connections on all of the equipment.
- ❑ Check LED indicators for the TCP/IP (RJ-45) connector on the Epica DGX 16 or 32.
- ❑ If the LED indicators are not illuminated, check the cable type to make sure it meets cable requirements (see page 43).
- ❑ Check LED indicators on the NetLinx Master.
- ❑ Ping the system, i.e., at the DOS prompt enter: ping XXX.XXX.XXX.XXX (where XXX.XXX.XXX.XXX is the NXB-AP-1000 Interface IP address; see page 80).
- ❑ Try connecting to the NXB-AP-1000 Interface again.

If the NXB-AP-1000 Interface still does not open, you may need to add an exception in the Proxy Setting dialog box.

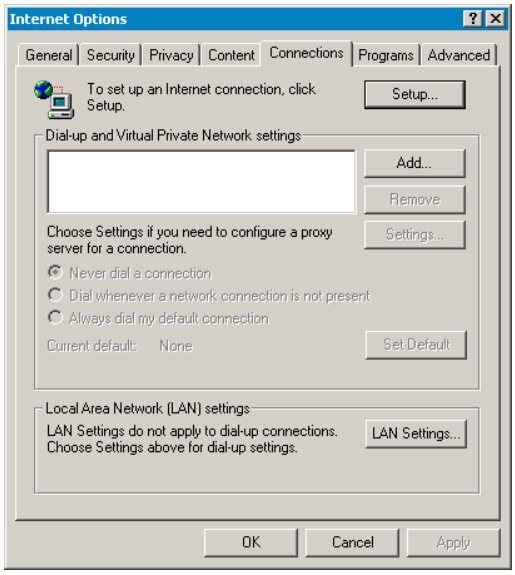
The following instructions apply to Internet Explorer. To change these settings in another browser, consult its Help file.

To add an exception to the proxy setting information:

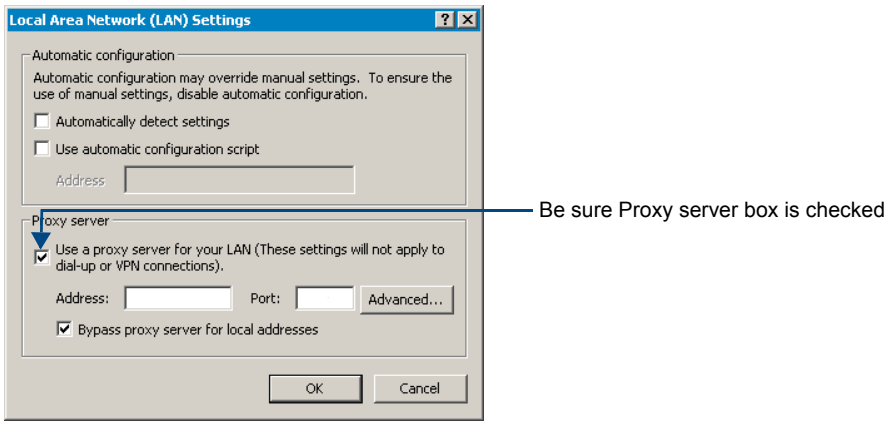
1. From the Tools menu on the browser, select Internet Options.
   The Internet Options dialog box opens.



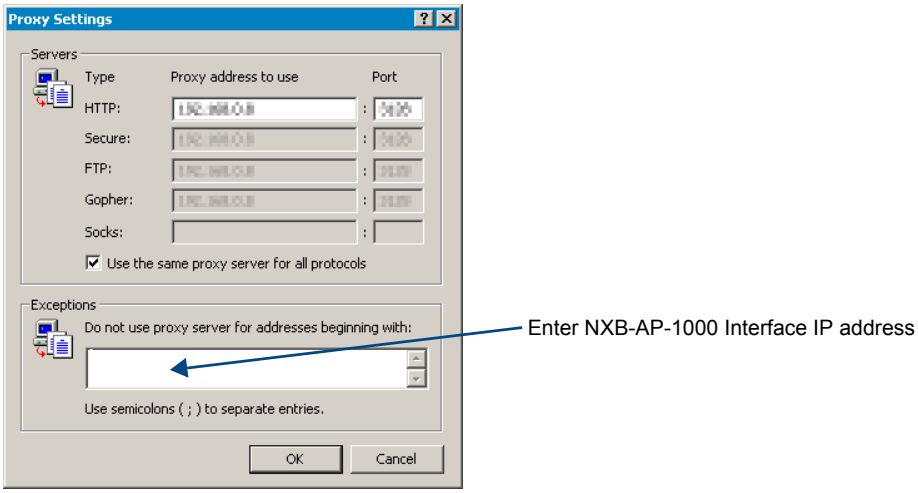
2. Select the Connections tab.



3. Click LAN Settings.
The Local Area Network (LAN) Settings dialog box opens.
If the Proxy server box is checked, go to Step 4.
If the Proxy server box is not checked, check it before going to Step 4.


Local Area Network (LAN) Settings
Automatic configuration
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.
Automatically detect settings
Use automatic configuration script
Address
Proxy server
Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).
Address:
Port:
Advanced...
Bypass proxy server for local addresses
OK
Cancel
Be sure Proxy server box is checked

4. Click Advanced.
   The Proxy Settings dialog box opens.



5. In the Exceptions field, enter the appropriate NXB-AP-1000 Interface IP address (see page 80).
6. Click OK to exit each of the dialog boxes used in these steps.

Epica DGX 16/32 NetLinx Programming

Overview

The Epica DGX 16/32 recognizes NetLinx SEND_COMMANDs with embedded BCS commands. Use NetLinx Studio (Version 3 or higher is required) to send these commands to the Epica DGX 16/32, or use these commands in standard compiled NetLinx Programming code running on a NetLinx Master.

Use the commands and ports specified in this chapter. Note, that the Device in <Device:Port:System> is the Epica DGX 16/32 enclosure's device number (see "Device Numbering" below). For information on ICSP connectivity, see the NetLinx Controller's instruction manual and the *Programming Guide – NetLinx Integrated Controllers* at **www.amx.com**.

Device Numbering

The Device ID number is listed in NetLinx Studio's OnLine Tree (FIG. 53) and is also listed in the Configuration Manager under the Admin menu on the Device Configuration page.

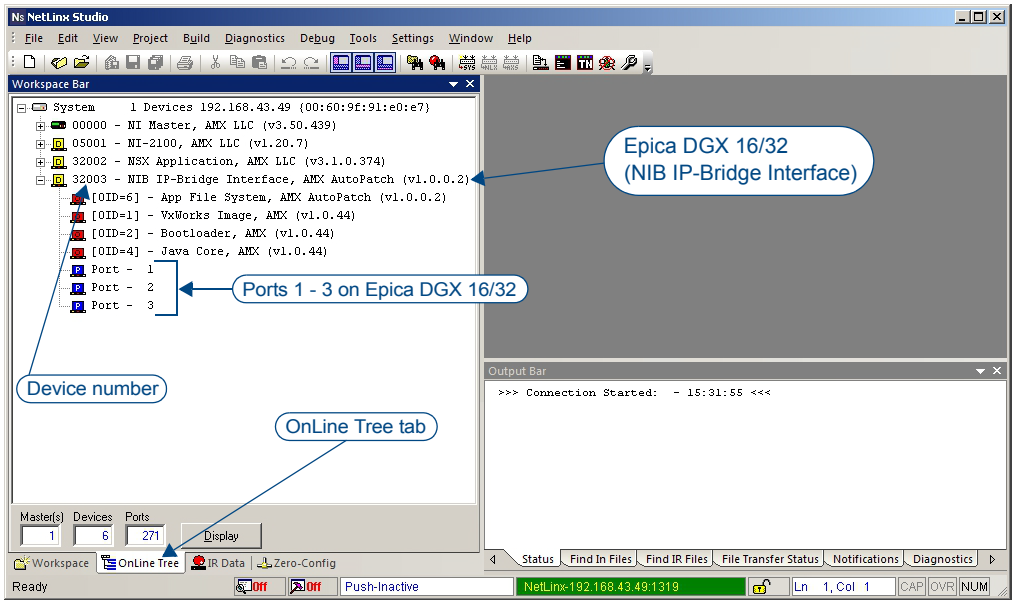

NetLinx Studio
File Edit View Project Build Diagnostics Debug Tools Settings Window Help
Workspace Bar
System 1 Devices 192.168.43.49 (00:60:9f:91:e0:e7)
00000 - NI Master, AMX LLC (v3.50.439)
05001 - NI-2100, AMX LLC (v1.20.7)
32002 - NSX Application, AMX LLC (v3.1.0.374)
32003 - NIB IP-Bridge Interface, AMX AutoPatch (v1.0.0.2)
[OID=6] - App File System, AMX AutoPatch (v1.0.0.2)
[OID=1] - VxWorks Image, AMX (v1.0.44)
[OID=2] - Bootloader, AMX (v1.0.44)
[OID=4] - Java Core, AMX (v1.0.44)
Port - 1
Port - 2
Port - 3
Epica DGX 16/32
(NIB IP-Bridge Interface)
Ports 1 - 3 on Epica DGX 16/32
Device number
OnLine Tree tab
Output Bar
>>> Connection Started: - 15:31:55 <<<
Master(s) Devices Ports
1 6 271
Display
Workspace OnLine Tree IR Data Zero-Config
Status Find In Files Find IR Files File Transfer Status Notifications Diagnostics
Ready
Push-Inactive
NetLinx-192.168.43.49:1319
Ln 1, Col 1
CAP OVR NUM

FIG. 53 NetLinx Studio OnLine Tree - indicating device number and ports for Epica DGX 16/32

Device Ports

In the OnLine Tree (FIG. 53), the Epica DGX 16/32 is listed as a device with 3 ports:

- **Port 1** – Reserved for future functionality (commands/strings sent to this port are ignored.)
- **Port 2** – Supports basic BCS commands incorporated into SEND_COMMANDs for Epica DGX 16/32 control and switching. Other commands/strings are rejected with a notice being sent back to the NetLinx Master.
- **Port 3** – Supports diagnostic and auxiliary BCS commands incorporated into SEND_COMMANDs. Due to the amount of data associated with some of these commands, responses may take up to 10 seconds to be returned.

SEND_COMMANDs

For the Epica DGX 16/32, SEND_COMMANDs carrying basic BCS commands for control operations (only) can be sent to Port 2, and SEND_COMMANDs carrying diagnostic or auxiliary BCS commands can be sent to Port 3.

The first table shows three SEND_COMMANDs with embedded basic BCS commands that can be sent to Port 2. The second table shows two SEND_COMMANDs with embedded diagnostic and auxiliary BCS commands that can be sent to Port 3.

SEND_COMMANDs for the Epica DGX 16/32 are not limited to the ones in the tables but can include additional BCS commands as well. For complete information on BCS commands, see the *Instruction Manual – BCS Basic Control Structure Protocol* on the *AMX AutoPatch CD* or at **www.amx.com**.

Note: *All text is based on a Unicode index.*

Epica DGX 16/32 SEND_COMMANDs - Basic BCS Commands	

" 'CL<L#>I<I#>O<O#>T' "
Connect inputs to outputs on the specified level (virtual matrix).
	Syntax:
	`SEND_COMMAND <Device:Port:System>,"'CL<L#>I<I#>O<O#>T'"`
	Note that the "Device" number is assigned by the NetLinx Master.
	Variables:
	• **L#** = level number (virtual matrix number) either **0** or **1** (both switch video along with any embedded audio)
	• **I#** = input port number for Epica DGX 16:
	1-16 = Inputs 1-16
	• **O#** = output port number for Epica DGX 16:
	1-16 = Outputs 1-16
	• **I#** = input port number for Epica DGX 32:
	1-32 = Inputs 1-32
	• **O#** = output port number for Epica DGX 32:
	1-32 = Outputs 1-32
	Example:
	`SEND_COMMAND 32003:2:0,"'CL0I2O4T'"`
	Connect Input 2 to Output 4 on Level 0 (Virtual Matrix 0).

" 'CI<I#>O<O#>T' "
Connect inputs to outputs on the default level (virtual matrix).
	Syntax:
	`SEND_COMMAND <Device:Port:System>,"'CI<I#>O<O#>T'"`
	Note that the "Device" number is assigned by the NetLinx Master.
	Variables:
	• **I#** = input port number for Epica DGX 16:
	1-16 = Inputs 1-16
	• **O#** = output port number for Epica DGX 16:
	1-16 = Outputs 1-16
	• **I#** = input port number for Epica DGX 32:
	1-32 = Inputs 1-32
	• **O#** = output port number for Epica DGX 32:
	1-32 = Outputs 1-32
	Example 1:
	`SEND_COMMAND 32003:2:0,"'CI6O4T'"`
	Connect Input 6 to Output 4 on default level.
	Example 2:
	`SEND_COMMAND 32003:2:0,"'CI3O7,8,9T'"`
	Connect Input 3 to Outputs 7, 8, and 9 on default level.

Epica DGX 16/32 SEND_COMMANDs - Basic BCS Commands (continued)	

" 'SL<L#>I<I#>T' " (input status)
or
" 'SL<L#>O<O#>T' " (output status)
Returns connection status. (To verify status on the default level, omit **L<L#>**.)
	Syntax:
	`SEND_COMMAND <Device:Port:System>,"'SL<L#>I<I#>T'"`
	or
	`SEND_COMMAND <Device:Port:System>,"'SL<L#>O<O#>T'"`
	Note that the "Device" number is assigned by the NetLinx Master.
	Variables:
	• **L#** = level number (virtual matrix number) either **0** or **1** (both switch video along with any embedded audio)
	• **I#** = input port number for Epica DGX 16:
	1-16 = Inputs 1-16
	• **O#** = output port number for Epica DGX 16:
	1-16 = Outputs 1-16
	• **I#** = input port number for Epica DGX 32:
	1-32 = Inputs 1-32
	• **O#** = output port number for Epica DGX 32:
	1-32 = Outputs 1-32
	Example 1:
	`SEND_COMMAND 32003:2:0,"'SL0I3'"`
	Returns which outputs are connected to Input 3 on Level 0 (Virtual Matrix 0).
	Example 2:
	`SEND_COMMAND 32003:2:0,"'SL0O25'"`
	Returns which input is connected to Output 25 on Level 0 (Virtual Matrix 0).
	Response is of the form:
	`SL<L#>I<I#>T(0#)` or `SL<L#>O<O#>T(I#)` or the parentheses will be empty `( )` if a connection is not present
	For example: `SL0I3T(4 7 16)` shows that Outputs 4, 7, and 16 are connected to Input 3 on Level 0 (Virtual Matrix 0).

Epica DGX 16/32 SEND_COMMANDs - Diagnostic and Auxiliary BCS Commands	

" '~scri<i#>v<v#>!' "
Diagnostic – Requests a level of detailed diagnostic information for all or one of seven system components.
	Syntax:
	`SEND_COMMAND <Device:Port:System>,"'~scri<i#>v<v#>!'"`
	Note that the "Device" number is assigned by the NetLinx Master.
	Variables:
	• **i#** = identity number 0-7 (use 0 for all components; 1-7 specify individual components)
	• **v#** = verbosity number 0-3 (specifies level of detail from 0 the lowest level to 3 the highest level)
	Example:
	`SEND_COMMAND 32003:3:0,"'scri6v3!'"`
	Requests the highest level of detail on the power system.

" '~app!' "
Auxiliary – Causes a warm reboot of the system.
	Syntax:
	`SEND_COMMAND <Device:Port:System>,"'~app!'"`
	Note that the "Device" number is assigned by the NetLinx Master.
	Example:
	`SEND_COMMAND 32003:3:0,"'~app!'"`
	Causes a warm reboot of the system.

Note: *For information on BCS commands for diagnostic purposes, see Appendix D on page 139.*

Appendix A – EDID Programmer

EDID Programmer software is provided for re-programming the EDID EEPROM chips on Epica DGX DVI Input Boards if necessary. This software is available on the *AMX AutoPatch CD* or at **www.amx.com**.

EDID Overview

EDID (Extended Display Identification Data) is a data structure established by the Video Electronics Standards Association (VESA) to enable plug-and-play support by enabling easy configuration of a computer's graphics subsystem based on the capabilities of the attached display device.

EDID information includes items such as the following:

- Manufacturer's name
- Product type
- Supported video resolutions and refresh rates
- Color space and filter chromaticity
- Detailed timings

When a computer is directly connected to a display device, it can use the display device's EDID information to determine an initial compatible video signal to send. With the computer's display controls, the user can modify this selection to another compatible signal based on the provided EDID information.

With DVI (which requires EDID on the display devices), using EDID information has extended beyond computers to other source devices, such as DVD players. As long as the source device sends a compatible signal, the plug-and-play feature will work.

Matrix Switchers and EDID

Matrix switchers, such as the Epica DGX 16/32, provide the ability to route one source signal to many potentially different types of display devices. Through the use of compatible DGX SC Fiber Receivers featuring SmartScale™, in almost all cases, incompatibilities between source device resolutions and displays are automatically resolved as each receiver independently scales each source device's video to the display's native resolution.

In cases where local DVI outputs are used and a resolution incompatibility exists (or if a source device desires a specific resolution), the DGX DVI input board is provided with the ability to update the EDID emulation file (by updating each input's EEPROM chip) which comes pre-loaded with an AMX AutoPatch EDID set.

This EDID set consists of some of the most common EDID settings in use today, including VESA and HDTV settings encompassing 8 resolutions with Standard Timings and 4 resolutions in 12 formats for Established Timings (for timing details, see page 54). In many cases, the matrix switcher can be used straight out of the box with no adjustments (see "Determining the Need for EDID Programming" on page 110).

The EDID Programmer software has been provided for cases where additional in-field programming of the EDID chips is needed. The Programmer can be used for the following:

- Reading and saving EDID data from a device
- Writing EDID data to an AMX AutoPatch matrix switcher's input connector's associated EDID EEPROM

Important: *Any analysis or editing of the EDID data necessary to support the equipment specific to your installation will need to be done separately prior to using the EDID Programmer. A variety of freeware tools can be found on the web to help with these tasks.*

Keep in mind that the EDID information for some equipment may not be compatible with the remaining equipment even with programming. In those cases, the signals will have limited routing options.

Tip: *If the signal from some of the equipment can only be routed to part of the destinations due to incompatible EDIDs, control can be simplified by creating a separate virtual matrix for the inputs and outputs involved. To request a modified configuration file with new virtual matrices, contact technical support (see page43) or see the XNConnect Help file for directions.*

The remaining sections provide information on:

- Determining the need for EDID programming
- Installing the EDID Programmer
- Reading and saving EDID data from a destination device
- Writing data to an Epica DGX 16 or 32 input connector

Determining the Need for EDID Programming

Ideally the EDID analysis will have been completed during installation specification. Consideration should be given to the use of DGX SC Fiber output boards and corresponding DGX SC Fiber Receivers which (in almost every case) will remedy incompatible source and destination resolution issues. Specific attention should be given to local output boards which do not provide automatic scaling via the SmartScale™ functionality. If this was not possible but all of the system's devices are now available, the most effective way to proceed is to test if the signal from each of the source devices can be routed through the Epica DGX 16 or 32 to each of the destination devices. If they can be routed, then EDID programming is *not* necessary.

A method of control is not specified in the following instructions. Any DGX TX and RX Modules for the system need to be installed before completing the following procedure.

To determine if EDID programming is necessary:

1. Route the first input to all of the applicable outputs.
2. Check each destination display to verify that the picture is present, making note of any that are not.
3. Repeat the Steps 1 and 2 for each of the remaining inputs.

Important: *If any of the destinations do not display a picture, analysis or editing of the EDID data may be necessary prior to using the EDID Programmer. A variety of freeware tools can be found on the web to help with these tasks.*

Installing the EDID Programmer

PC System Requirements for EDID Programmer v1.2.0

- ❑ Windows XP Professional®
- ❑ Minimum Hardware: 166 MHz, 128 MB RAM, 20 MB of free disk space*, 800x600 display, serial port, video card with dual outputs**
- ❑ Recommended Hardware: 2.0 GHz, 512 MB RAM*

* The installation process requires 20 MB of disk space for the EDID Programmer installer. Once installed, the EDID Programmer requires 5 MB of disk space.

** We strongly urge the user *not to use video cards with DMS-59 connectors*. Video cards with DMS-59 connectors have been shown to fail consistently and, in the worst case, *can corrupt an EDID data file*. A laptop PC with a VGA or DVI out is a good solution. Cards with 2 DVI connectors, 2 VGA connectors, or 1 DVI and 1 VGA connector are also acceptable.

To install EDID Programmer software:

1. Locate and open the installer <EDIDProgrammer_1.2.exe> on the *AMX AutoPatch CD* or at **www.amx.com**.
2. Follow the directions in the wizard.

Reading and Saving EDID Data from a Destination Device

Tip: *The Save button in the EDID Programmer can be used to save the EDID information as an .edid file, which can be opened as a text file (click on the Open button) and edited or opened and written to an input (click the Write button).*

The instructions below cover the situation in which the EDID Programmer is used to read the EDID information from a destination device in the installation with a DVI connector (an HD-15 connector can also be used). Additional information for using cable adapters is provided on the next page.

To read and save EDID data from a destination device:

1. On the PC, open the EDID Programmer.

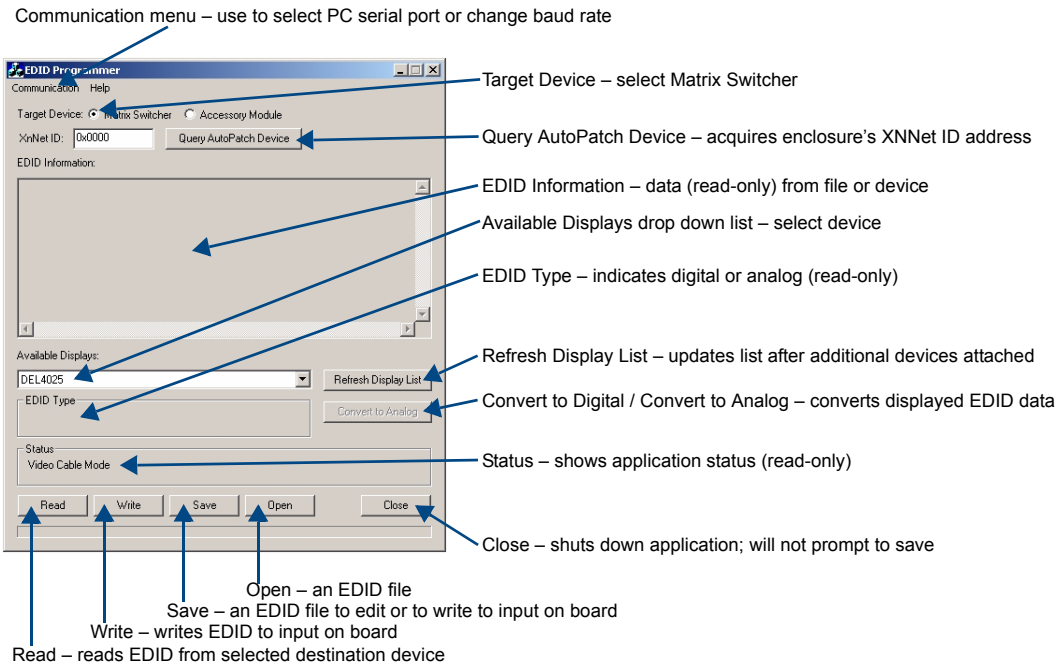

Communication menu – use to select PC serial port or change baud rate
EDID Programmer
Communication Help
Target Device: Matrix Switcher Accessory Module
XnNet ID: 0x0000
Query AutoPatch Device
EDID Information:
Available Displays:
DEL4025
Refresh Display List
EDID Type
Convert to Analog
Status
Video Cable Mode
Read
Write
Save
Open
Close
Target Device – select Matrix Switcher
Query AutoPatch Device – acquires enclosure's XNNet ID address
EDID Information – data (read-only) from file or device
Available Displays drop down list – select device
EDID Type – indicates digital or analog (read-only)
Refresh Display List – updates list after additional devices attached
Convert to Digital / Convert to Analog – converts displayed EDID data
Status – shows application status (read-only)
Close – shuts down application; will not prompt to save
Open – an EDID file
Save – an EDID file to edit or to write to input on board
Write – writes EDID to input on board
Read – reads EDID from selected destination device

FIG. 54 EDID Programmer

2. Connect a DVI cable to the PC using the PC's spare monitor port (if your laptop has an HD-15 [VGA] port, see "Using Cable Adapters" on the next page).
3. Connect the open end of the DVI video cable to the destination device (typically a monitor) from which the EDID information needs to be read.
4. Click the Refresh Display List button to update the Available Displays drop down list.
5. From the Available Displays drop down list, select the destination device from which you need to read the EDID.
6. Click the Read button to read the EDID information. The results display in the read-only area.
7. Click the Save button (select location, enter file name, and click Save).
   Leave the EDID Programmer open for instructions on writing the EDID to the TX on the next page.

8. Disconnect the DVI cable from the PC and from the destination device.

Using Cable Adapters

If your laptop has an HD-15 (VGA) port, you can use a DVI-to-VGA cable to connect the laptop's HD-15 video port to a DVI cable attached to a destination device's DVI port. Alternatively, use the following combination of adapters with a DVI-D cable to connect the laptop to the destination device:

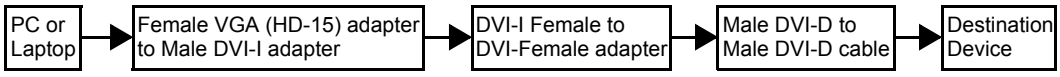

PC or Laptop
Female VGA (HD-15) adapter to Male DVI-I adapter
DVI-I Female to DVI-Female adapter
Male DVI-D to Male DVI-D cable
Destination Device

FIG. 55 Connecting an HD-15 (VGA) port to a DVI port

Note: *The setup of adapters and DVI-D cable in FIG. 55 passes EDID information but does not video signals.*

Writing EDID Data to Epica DGX 16 or 32 DVI Input Connector

The instructions that follow cover the situation in which the EDID Programmer is used to write EDID information to the EDID chip for an input connector on a DGX DVI Input Board that still has the factory default settings.

To write EDID data to the EDID chip for an input connector:

1. Attach a null modem serial cable without hardware flow control to the serial port (DB-9) on the Epica DGX 16 or 32. Use a serial cable that matches the pin diagram in FIG. 56 for RS-232. AMX AutoPatch equipment uses pins 2, 3, and 5 only.

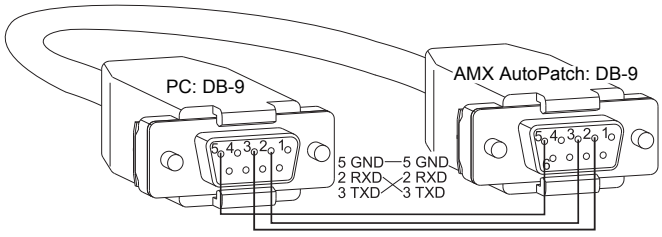


FIG. 56 RS-232 pinout

2. Attach the open end of the serial cable to the PC that the EDID Programmer will be opened on.
3. Apply power to the enclosure.
4. On the PC, open the EDID Programmer (see page 111).
5. If necessary – From the Communication menu, select Change Settings to change the baud rate for the PC's serial port, which *must* match the baud rate for the Epica DGX 16 or 32. The recommended (default) settings for serial communication with an Epica DGX 16 and 32 are: baud rate – 9600, data bits – 8, parity – none, stop bits – 1, and flow control – none.
6. For the Target Device, select the Matrix Switcher option.
7. Click the Query AutoPatch Device button to obtain the XNNet ID address from the enclosure.
8. Attach a DVI video cable to the PC using the PC's spare monitor port.
9. Attach the open end of the DVI video cable to the DVI input connector on the Epica DGX DVI Board that requires programming.

10. Save the board's EDID default as a backup (assumes the board has factory default EDID programming).
    - Click the Refresh Display List button.
    - Select the device.
    - Click the Read button.
    - Click the Save button (select location, enter file name, and click Save).
11. Click the Open button to select the .edid file to be written to the DVI input connector.
12. Click the Write button to write the EDID information to the DVI input connector.
13. If applicable – Repeat any of the steps that are necessary for any additional DVI input connectors.
14. Disconnect the DVI video cable from the PC and from the Epica DGX DVI Input Board.
15. Disconnect the serial cable from the PC and from the Epica DGX 16 or 32 enclosure.

Appendix B – Managing Configuration Files

Applicability Notice

This appendix applies to XNConnect version 2.10.0. XNConnect's version information is found under its Help menu. Version 2.10.0 supports full Device Discovery through AMX's AutoPatch Duet module.

This appendix covers the following general information on using XNConnect configuration software and basic modifications for customizing the configuration:

- Installing XNConnect (see page 117)
- Discovering a system (see page 118)
- Opening an .xcl configuration file (see page 119)
- Navigating the interface (see page 120)
- Setting the Control Panel password (see page 121)
- Creating local presets (see page 122)
- Loading an .xcl configuration file (see page 124)
- Device Discovery support (see page 125)

For complete coverage of XNConnect including modifying virtual matrices and hardware, see the XNConnect Help file. If your configuration file needs any type of advanced modification, we *strongly recommend* contacting technical support to request a modified .xcl file or ask for assistance.

Standard Virtual Matrices and XNConnect

The standard virtual matrix for switching signals in Epica DGX 16 and 32 Distribution Matrices is VM 0, which routes video. For video sources that also include audio (e.g., sources with video and embedded audio routed through DGX SC Optical Boards), VM 0 routes the video and any embedded audio. Embedded audio does *not* have a separate virtual matrix for switching and *cannot* be broken away from the video.

VM 1, which switches exactly the same as VM 0, is also provided as an option for compatibility purposes with control software and equipment.

Additional VMs can be created and are useful in some situations. Control can be simplified by creating a separate virtual matrix for the inputs and outputs involved, e.g., if the signal from some of the equipment can only be routed to part of the destinations due to incompatible Edits or to provide restricted access to certain source or destinations. The XNConnect Help file contains information on creating new VMs.

Caution: *Virtual matrix modifications are an advanced feature of XNConnect that should not be attempted unless you are extremely familiar with XNConnect and the AMX AutoPatch Distribution Matrix being configured.*

Note: *If you use the advanced feature of creating a new virtual matrix (VM), be aware that the Control Panel for the Epica DGX 16 and 32 supports a maximum of two digits for virtual matrix numbers.*

Overview

Caution: *Unless you need to reload the .xcl configuration file or modify your system's configuration from the original specifications, you will not need to use XNConnect. We recommend making a copy of the current file every time the file is modified.*

XNConnect can be used to modify a system's configuration information which contains routing and control information. XNConnect is provided on the *AMX AutoPatch CD* shipped with each system. Configuration file modifications include basic tasks, such as creating local presets and setting the Control Panel password.

Epica DGX 16 and 32 Distribution Matrices are configured either conventionally or automatically.

Conventional Configuration

Epica DGX 16 and 32 systems are conventionally configured when an .xcl configuration file (created in XNConnect) is downloaded to the CPU before shipment (applies to some custom systems).

When a system is conventionally configured, the .xcl file can be accessed for modification in one of two ways: either use XNConnect to discover the .xcl file on the CPU or use XNConnect to open a copy of the .xcl file. The .xcl file copy is provided on the *AMX AutoPatch CD* (MyXCL folder). In either case, after the configuration is modified in XNConnect, it is loaded back onto the CPU (replacing the original file).

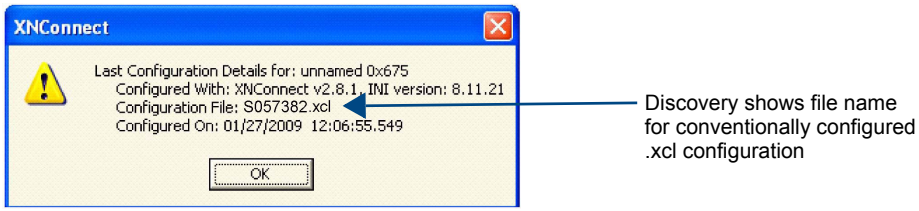

XNConnect
Last Configuration Details for: unnamed 0x675
Configured With: XNConnect v2.8.1, INI version: 8.11.21
Configuration File: S057382.xcl
Configured On: 01/27/2009 12:06:55.549
OK
Discovery shows file name for conventionally configured .xcl configuration

FIG. 57 Example of discovery information for conventionally configured .xcl file

Automatic Configuration

Epica DGX 16 and 32 systems are automatically configured when the systems generates their own configuration based on the installed hardware (applies to most Epica DGX 16 and 32 single-enclosure systems). The configuration is constructed internally with a standard virtual matrix (see previous page) by the CPU upon initial boot up of the system.

When a system is automatically configured, the configuration information can be accessed for modification in only one way since an .xcl file does not exist for the system. Use XNConnect to discover the configuration information from the CPU. The discovered configuration information can then be saved as an .xcl file. After the configuration is modified in XNConnect, it is loaded back onto the CPU (replacing the automatically constructed configuration). If necessary, the automatically constructed configuration can be restored (see page 125).

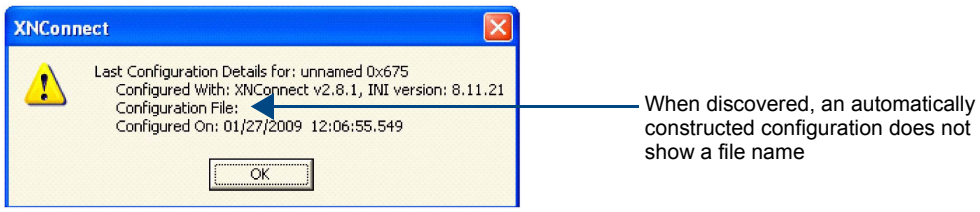

XNConnect
Last Configuration Details for: unnamed 0x675
Configured With: XNConnect v2.8.1, INI version: 8.11.21
Configuration File:
Configured On: 01/27/2009 12:06:55.549
OK
When discovered, an automatically constructed configuration does not show a file name

FIG. 58 Example of discovery information for automatically constructed configuration

AMX AutoPatch CD Information

If you cannot locate the *AMX AutoPatch CD* that shipped with your system and your AMX account has the required permissions, you can download the newest version of XNConnect from **www.amx.com**. An INI file Updater for updating XNConnect is available on the AMX website under Tech Center \ AutoPatch Tools; an account is not required. If you need an .xcl configuration file that is compatible with your system, either discover the system (see page 118) or contact technical support (see page 42) and provide your system's serial number.

Installing and Launching XNConnect

Use this software *only* if you need to customize or change the configuration information from the original specification.

Important: *Even if XNConnect is already on your PC, install the newest version that shipped on the "AMX AutoPatch CD" with your system. We strongly recommend uninstalling the old version of XNConnect before installing a new version.*

System Requirements

- Windows XP Professional®
- 233 MHz processor
- Minimum of 128 MB of RAM
- 20 MB of available hard drive space
- 800x600 screen resolution (1024x768 is recommended)
- Serial port and RS-232 null modem cable

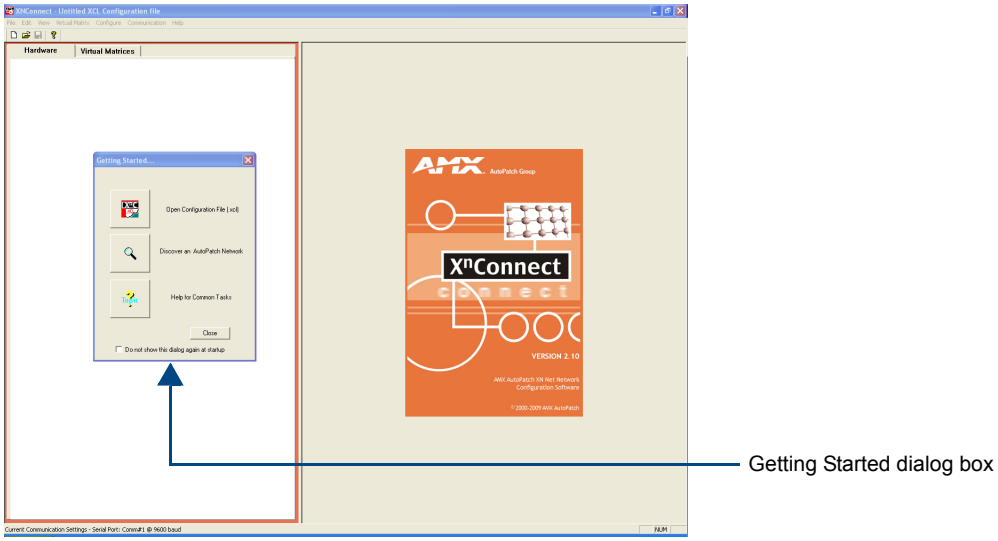
To install XNConnect from the AMX AutoPatch CD:

1. Close all other applications currently running on your PC.
2. Insert the *AMX AutoPatch CD* into your CD drive to start automatically.
   If the CD does not autorun, explore the CD folder and double-click the Index.html file.
3. Select Software and find XNConnect.
4. Optional – Select the Release Notes to read about the software before installation.
5. Select Install.
6. Follow the directions in the subsequent dialog boxes.

Note: *If your account has the required permissions, the newest version of XNConnect can be downloaded from **www.amx.com**. An AutoPatch INI Updater file can also be found on the AMX website under Tech Center \ AutoPatch Tools for updating XNConnect with information for new support devices and input and output boards (an account is not required).*

To launch XNConnect:

1. From the Start menu, select Programs.
2. Select AutoPatch Applications (or other file group you specified during the installation).
3. Select the XNConnect folder.
4. Select XNConnect.
   The XNConnect program opens.



When XNConnect is open, two options are available for accessing the information:

- Discover the system (recommended). This works for both conventionally and automatically configured systems (see page 116).
- Open a copy of the .xcl file located in the MyXCL folder on the *AMX AutoPatch CD*. The .xcl file is only available on the CD if the system was conventionally configured (see page 116).

Discovering a System

The discovery process queries the attached system for configuration information and properties, including information regarding assigned signals and virtual matrix definitions. The discovery process may take several minutes to complete.

We recommend disconnecting any third-party control devices from the enclosure's serial ports *before* starting the discovery process.

To discover a system:

1. Disconnect any third-party control devices from the enclosure's serial (Control) port.
2. Connect the enclosure to the PC (see page 29). (For systems with multiple enclosures, you can connect any of the enclosures to the PC as long as all of the enclosures are linked together.)
3. (If not already open) Launch XNConnect (see above).
4. Open the Communication menu; select Serial Port.

5. If applicable – For a serial port other than Com 1 (default), open the Communication menu again, select Change Comm Settings. Check the settings for the selected port and adjust if necessary (the default is Com 1, baud rate 9600).
6. Optional – Click the Test button to verify that communication has been established with the enclosure. Click OK.
7. From the File menu, select Discover System (the discovery may take a few minutes).
8. From the File menu, select Save to save the discovered configuration information to the PC.
9. From the File menu, select Save As and save an .xcl file with a new name to the PC. (We recommend making a duplicate copy every time the file is modified.)

The discovered configuration file is ready to be modified. Whenever changes are made, the new file *must* be loaded onto the system to implement the changes (see page 124).

Opening an .xcl Configuration File

The process of modifying an .xcl configuration file starts by opening it with XNConnect (or discovering system information; see page 118). After modifications are complete, the new configuration information *must* be loaded onto the system to implement the changes.

Important: *Even if XNConnect is already on your PC, install the newest version that shipped on the same CD as the .xcl configuration file. We strongly recommend uninstalling the old version of XNConnect before installing a new version.*

Caution: *Use XNConnect only if you need to load or reload the .xcl configuration file or modify your system's configuration from the original specification. Make a copy of the original file every time the file is modified.*

To open an .xcl file:

1. Launch XNConnect (see page 118).
2. From the Getting Started dialog box, click Open Configuration File. (If the dialog box does not appear, from the File menu select Open.)
3. Use the standard Open dialog box to locate and open the .xcl configuration file. The default location is in the MyXCL folder on the *AMX AutoPatch CD*.
4. From the File menu, select Save As and save an .xcl file with a new name to the PC. (We strongly recommend making a duplicate copy every time the file is modified.)

The .xcl file is ready to be modified. Whenever changes are made, the new file *must* be loaded onto the system to implement the changes (see page 124).

Navigating the Interface

XNConnect displays configuration information in two panes. The graphics are located in the left pane, and the properties of the currently selected graphic are in the right pane. At the top of the left pane are two tabs, Hardware and Virtual Matrices, for accessing the Hardware and Virtual Matrices views (see below). To see the details and components of a device or a virtual matrix, click the plus "+" symbol to the left of the device or the virtual matrix.

Most configuration file modifications involve entering information in a series of dialog boxes that are accessed by right-clicking a hardware device or virtual matrix icon and selecting an option from the shortcut menu. If you have a question regarding an open dialog box, press the F1 key for Help.

Hardware View

The Hardware view (FIG. 59) displays the system's hardware, such as enclosures and serial ports. This is the view used when setting the Control Panel password (see page 121).

Virtual Matrices View

The Virtual Matrices view displays properties of the existing virtual matrices. Most common tasks are conducted from this view, including creating local presets.

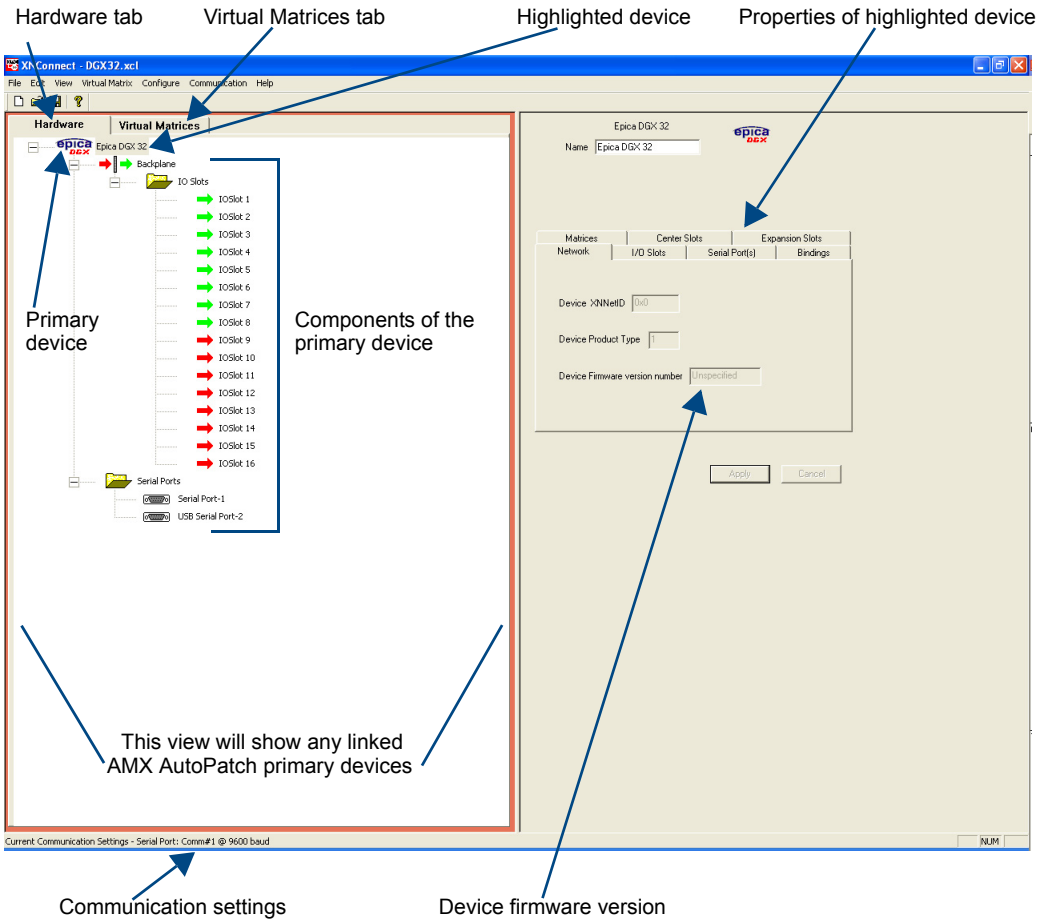


FIG. 59 XNConnect interface with Hardware tab selected

Modifying an .xcl Configuration File

Modifying an .xcl configuration file with XNConnect involves entering information in a field or in a series of dialog boxes. A brief look at the contents in the Help file provides a quick overview of the possible modifications.

This section provides instructions for two common tasks: setting the Control Panel password and creating local presets. For complete coverage of configuration related tasks, see the XNConnect Help file.

Setting the Control Panel Password

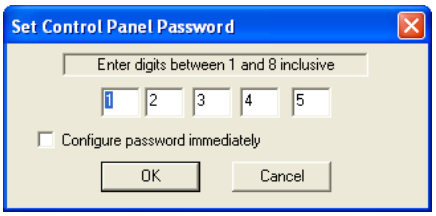
The Control Panel can be locked and unlocked (for directions, see page 72). Locking the panel prohibits access to the system and can prevent accidental switching. The password can be set either with the Control Panel (see page 76) or with XNConnect (see below). If a password has been created and downloaded to the system from XNConnect, a new password can be set from the Control Panel to replace it; however, the previous one *must* be entered first. If a password is set with the Control Panel, a new password can be set and downloaded to the system using XNConnect.

The password consists of five digits between 1 and 8 that are entered on the Control Panel using a combination of five of the first eight Input Keys (keys can be used multiple times).

The system connected to the PC *must* be powered up before the password can be loaded to the Control Panel. If not already connected, complete the first five steps of the instructions for "Discovering a System" on page 118.

To set the password and load it to the Control Panel:

1. Discover the system (see page 118) or open the .xcl file (see page 119).
2. In the Hardware view, right-click the Control Panel icon (CP-15 style).
   If the Control Panel icon is not displayed, double-click the Epica DGX 16 or 32 icon.
3. Select Set Password from the drop-down menu.
   The Set Control Panel Password dialog box opens.



4. Enter a single digit between one and eight (inclusive) in each field.
5. Check the box for Configure Password Immediately.

Important: *If you use the Configure menu instead of checking the box, the only configuration option that will load password information is Configure \ Configure Special - Hardware \ Configure All Passwords.*

6. Click OK.
   The updated password information is immediately loaded to the Control Panel, and the new password sequence *must* be used to lock and unlock the Control Panel.
7. From the File menu, select Save As and save an .xcl file with a new name to the PC.
   (We *strongly* recommend making a duplicate copy every time the file is modified.)

Creating Local Presets

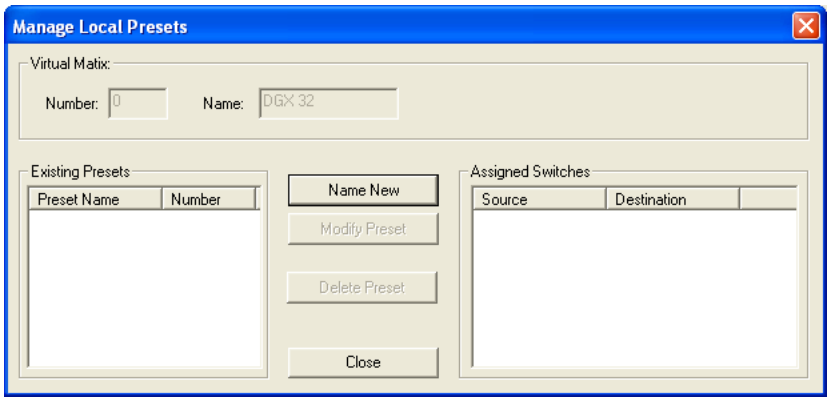
A local preset is a predetermined collection of switches on the same virtual matrix to be routed simultaneously. Executing a local preset affects only those inputs and outputs specified, not the whole system. Local presets are defined using XNConnect and can be executed using the Control Panel or using BCS commands entered as part of a macro in APControl 3.0 or entered in a terminal emulation program. The process for creating local presets involves three dialog boxes that cover managing, naming, and modifying presets.

The Epica DGX 16 and 32 each support a maximum of 64 local presets.

The instructions following are for creating a local preset. For detailed information on modifying and deleting local presets, see the XNConnect Help file.

To create a new preset:

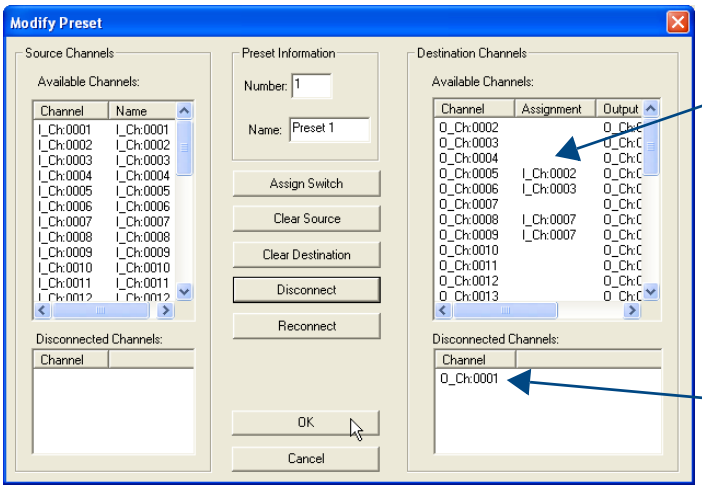
1. In the Virtual Matrices view, right-click the virtual matrix the preset will be created for and select Manage Local Presets from the shortcut menu.
   The Manage Local Presets dialog box opens.



2. Click the Name New button.
   The Name New Preset dialog box opens.

3. Optional – Enter a different preset number (local presets do not need to be numbered sequentially).
4. Enter a name for the new preset.
5. Click OK.
   The Modify Preset dialog box opens.

6. For the first switch, click the source channel (input) and one or more destination channels (outputs). Select multiple destination channels by holding down the Control key while selecting the channels.



The Assignment column shows three switches that will be executed as part of Preset 1:

- Input 2 to Output 5
- Input 3 to Output 6
- Input 7 to Outputs 8 and 9

The Disconnected Channels box shows that Output 1 will be disconnected as part of Preset 1.

7. Click the Assign Switch button.
   The input appears in the Assignment column of the Destination Channels list; the switch will execute when the local preset is executed.
8. Disconnect inputs* or outputs as part of the local preset by selecting either the source or destination channel and clicking the Disconnect button.
   The input or output appears in its corresponding Disconnected Channels list; the input or output will be disconnected when the local preset is executed.
   * Disconnecting an input will disconnect all outputs it is connected to.
9. Repeat Steps 6, 7, and 8 for all switches and/or disconnects to be included in the preset.

Note: *For information on the other buttons and preset modifications, press F1 while the Manage Local Presets dialog box is open.*

10. After all switches for the preset have been assigned, click OK and then close the Manage Local Presets dialog box.
11. Define additional local presets by repeating the steps.

Caution: *The system must not be actively switching when loading this information onto the system.*

12. When all local presets have been defined, load the .xcl configuration file onto the system (see page 124).
    If the .xcl configuration file has been previously loaded to the system and local presets are the only modifications that have been made to the .xcl file, select Configure \ Configure Special – Virtual Matrix \ Configure All VM Local Presets.
    If the .xcl file is being loaded for the first time (assumes an automatically constructed configuration is on the CPU), select Configure \ Configure All.
13. From the File menu, select Save As and save an .xcl file with a new name to the PC.
    (We *strongly* recommend making a duplicate copy every time the file is modified.)
14. Reload the .xcl file from the CPU to the Control Panel according to the directions on page 75.

Loading an .xcl Configuration File

Once modifications have been made to the .xcl configuration file, the new file *must* be loaded onto the system's CPU for the changes to be implemented.

The two basic options for loading an .xcl configuration file are:

- Load the entire file using the "Configure All" option (see Caution below).
- Load part of the file using one of the "Configure Special" options.

To determine which configuration option to use, see "Configure Menu Commands" in the Help file.

When loading any part of an .xcl configuration file, the matrix switcher *must not* be actively switching. You may want to lock the Control Panel (see page 72) and disconnect any external controllers to make sure that no switches are executed during the loading of the file.

Caution: *Using the "Configure All" option or the "Configure All Virtual Matrices" option will erase any global presets (see the "Instruction Manual – BCS Basic Control Structure Protocol") that have already been defined for the system.*

To load an .xcl configuration file to the enclosure's CPU:

Important: *The matrix switcher must not be actively switching when loading any part of or all of the .xcl configuration file.*

1. Recommended – Lock the Control Panel and/or disconnect any external controllers to make sure that no switches are executed during the loading of the file.
2. If you have not already done so – From the File menu, select Save As and save an .xcl file with a new name to the PC. (We *strongly* recommend making a duplicate copy every time the file is modified.)
3. Connect the Epica DGX 16 or 32 enclosure to the PC (see page 29). (For systems with multiple enclosures, you can connect any of the enclosures to the PC as long as all the enclosures are linked together.)
4. In XNConnect, open the Communication menu and select Serial Port.
5. Open the Communication menu again, select Change Comm Settings.
6. Check the settings for the selected port and adjust if necessary (the default is Com 1 with a baud rate of 9600).
7. Optional – Click the Test button to verify that communication has been established with the Epica DGX 16 or 32. Click OK.
8. From the Configure menu, select the appropriate configuration option For an explanation of Configuration menu options, see the Help file. (The Configure All option will not load password information. For instructions on loading password information, see page 121.)

The system automatically reboots (applies to non-hardware configuration options only; for hardware, select the appropriate configuration option and then Configure > Reboot All Devices).

9. If local presets were created and loaded to the CPU – Reload the .xcl file from the CPU to the Control Panel according to the directions on page 75.

Restoring the Automatic Configuration

Caution: *Restoring the automatically constructed configuration will result in the loss of all custom .xcl configuration file modifications (local presets, passwords, etc.).*

To restore the automatically constructed configuration:

1. Connect the system to a PC (see page 29).
2. Open a terminal emulation program (e.g., HyperTerminal).
3. Enter: `~def!` to restore the configuration.
4. Wait for a "V" to be returned (may take several seconds).

Device Discovery Support

XNConnect v2.10.0 supports Device Discovery. Typically the default string generated by XNConnect is all that is necessary. However, certain conditions may warrant a custom string, such as the need to limit the VMs that are available for control by an AMX control system. Or a need may exist to limit the features available for a system, e.g., omitting the ability to adjust input gain, but leaving support for output volume in an Epica DGX 16 or 32 system that links to enclosures with adjustable audio. To customize the configuration string, see the XNConnect Help file topic "Device Discovery Config String Input."

Appendix C – APDiagnostics

Overview

APDiagnostics is a software application that monitors and displays advanced diagnostic information about the Epica DGX 16 and 32. (APDiagnostics also works with other AMX AutoPatch products that are capable of reporting such data.) This application is available on the *AMX AutoPatch CD* or at **www.amx.com**.

System Requirements

- Windows XP Professional®
- Java Runtime Environment (JRE): v1.5 or the latest version
- Minimum Hardware: 166 MHz, 128 MB RAM, 20 MB of free disk space*, 800x600 display, serial port
- Reccommended Hardware: 2.0 GHz, 512 MB RAM, 100 MB free disk space*, dual 1024x768 monitor display, Ethernet port**

* The installation process requires 20 MB of disk space for the APDiagnostics installer and 200 MB of disk space for the JRE v1.5 that is packaged with the installer (if required). Once installed, APDiagnostics requires 5 MB and JRE v1.5 requires approximately 100 MB of disk space.

** We *strongly* encourage using the Ethernet link whenever possible, due to the volume of data involved with monitoring diagnostics. For additional information, see "Communications" on page 138.

Installing APDiagnostics

You will need administrative rights to install APDiagnostics; contact your Network Administrator.

Note: *The default port when APDiagnostics is first launched is the Ethernet (Enc Link) port.*

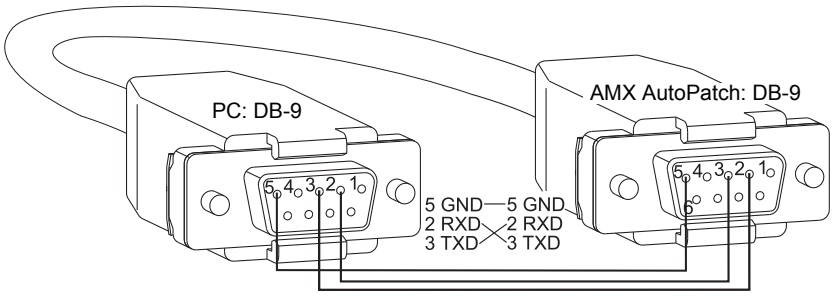
To install APDiagnostics using an Enc Link port (recommended):

1. Connect an RJ-45 cable to an Enc Link (Ethernet 10/100) port on the Epica DGX 16 or 32.
2. Attach the other end of the RJ-45 cable to a PC.
3. Insert the *AMX AutoPatch CD* into your CD drive to start automatically.
   If the CD does not autorun, explore the CD folder and double-click the Index.html file.
4. Select Software and find APDiagnostics.
5. Optional – Select Release Notes to read about the software before installation.
6. Select Install and follow the directions in the subsequent dialog boxes.
7. If applicable – For multiple-enclosure systems, you will be prompted to select the enclosure that you want to monitor (only enclosures supporting APDiagnostics will be available).
8. Open APDiagnostics in Acquisition mode.*
9. Select Comm / Settings.
10. Select the Ethernet tab and set the NIC ID (if the NIC ID is not already displayed, you can find it by following the directions at the bottom of page 138).
11. Click Accept.

* The default preference is to open APDiagnostics in Acquisition mode.

To install APDiagnostics using the serial port:

1. Attach a null modem serial cable without hardware flow control to the Control (DB-9 serial) port on the Epica DGX 16 or 32. Use a null modem cable that matches the pin diagram below for RS-232. AMX AutoPatch equipment requires pins 2, 3, and 5 only.



2. Attach the other end of the null modem cable to a PC.
3. Use serial communication software to make sure the PC's baud rate is set correctly for the system. The recommended (default) settings for serial communication for Epica DGX 16 and 32 systems are provided in the table to the right.
4. Insert the *AMX AutoPatch CD* into your CD drive to start automatically. If the CD does not autorun, explore the CD folder and double-click the Index.html file.
5. Select Software and find APDiagnostics.
6. Optional – Select Release Notes to read about the software before installation.
7. Select Install and follow the directions in the subsequent dialog boxes.
8. If applicable – For multiple-enclosure systems, you will be prompted to select the enclosure that you want to monitor (only enclosures supporting APDiagnostics will be available).
9. Open APDiagnostics in Acquisition mode.*
10. Select Comm / Settings.
11. Select the Serial Port tab and set the Comm ID and baud rate (9600).
12. Click Accept.

Epica DGX 16 and 32 Serial Port Settings	
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

* The default preference is to open APDiagnostics in Acquisition mode.

Modes

Note: *If the system contains multiple enclosures, you will be prompted to select the enclosure before you select the mode.*

This program can be opened in one of two modes: Acquisition (default) or Emulation.

Acquisition Mode

Note: *Only a single instance of the application can run on a PC when in Acquisition mode.*

Acquisition mode is used to gather and display real-time diagnostic data from an attached AMX AutoPatch Distribution Matrix. For this mode to be used effectively, we recommend using a dedicated PC because the Epica DGX 16 or 32 *must* be connected to your PC via an Enc Link (Ethernet 10/100) port (default) or Control (DB-9 serial) port *and the program must be running continuously to acquire data*. This data consists of system-critical operating parameters, as well as general information about hardware and control configuration. As the data is gathered, it is automatically archived on the host PC's hard-drive. The three distinct types of files maintained by APDiagnostics are: date-stamped log files, .acp (packet) files, and activity files. The archived files can be emailed to technical support for trend analysis and troubleshooting or can be opened by APDiagnostics in Emulation mode for analysis.

Emulation Mode

This mode is an "off-line" mode used to process and display data that was gathered from an actual system while in Acquisition mode. This mode allows the user to "play back" the system's behavior during a specified period of time for trend analysis and troubleshooting.

Main Screen and Menus

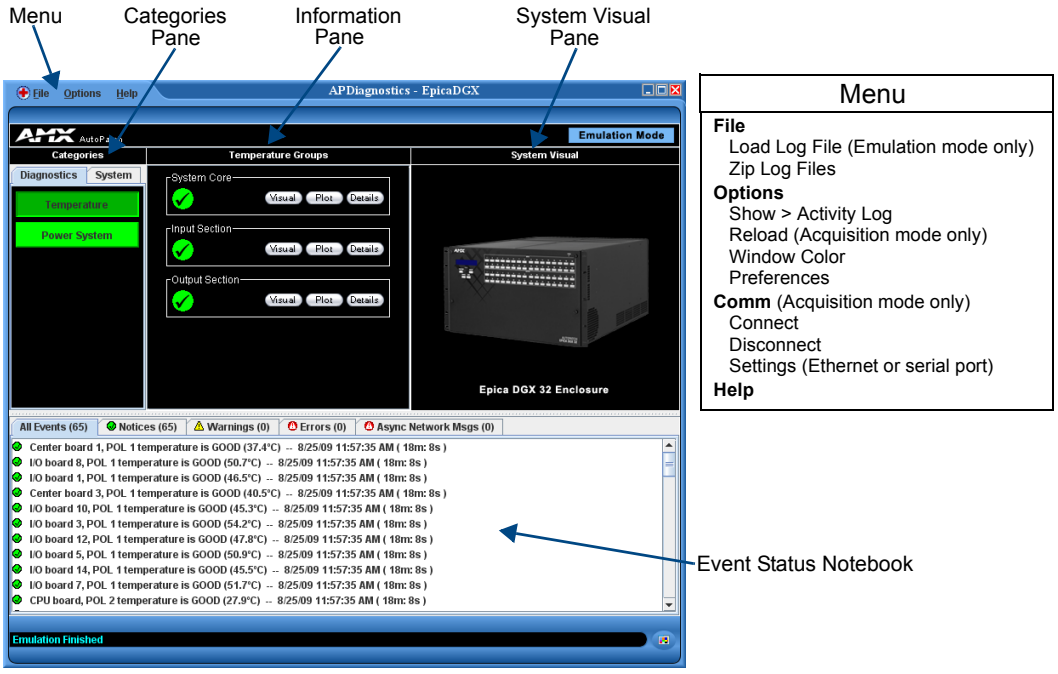

Menu
Categories Pane
Information Pane
System Visual Pane
File Options Help
APDiagnostics - EpicaDGX
Emulation Mode
Categories
Temperature Groups
System Visual
Diagnostics
System
Temperature
Power System
System Core
Input Section
Output Section
Visual
Plot
Details
Epica DGX 32 Enclosure
All Events (65)
Notices (65)
Warnings (0)
Errors (0)
Async Network Msgs (0)
Center board 1, POL 1 temperature is GOOD (37.4°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 8, POL 1 temperature is GOOD (50.7°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 1, POL 1 temperature is GOOD (46.5°C) -- 8/25/09 11:57:35 AM (18m: 8s)
Center board 3, POL 1 temperature is GOOD (40.5°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 10, POL 1 temperature is GOOD (45.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 3, POL 1 temperature is GOOD (54.2°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 12, POL 1 temperature is GOOD (47.8°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 5, POL 1 temperature is GOOD (50.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 14, POL 1 temperature is GOOD (45.5°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 7, POL 1 temperature is GOOD (51.7°C) -- 8/25/09 11:57:35 AM (18m: 8s)
CPU board, POL 2 temperature is GOOD (27.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
Emulation Finished
Menu
File
Load Log File (Emulation mode only)
Zip Log Files
Options
Show > Activity Log
Reload (Acquisition mode only)
Window Color
Preferences
Comm (Acquisition mode only)
Connect
Disconnect
Settings (Ethernet or serial port)
Help
Event Status Notebook

FIG. 60 Main screen in Emulation mode (the Comm menu option is not available in this mode)

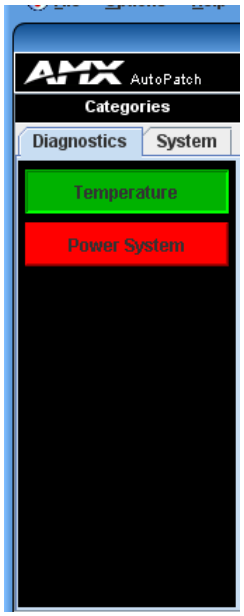
Note: *Custom window colors can be applied to the Main Screen. For instructions on modifying the Main Screen's color, see the APDiagnostics Help file.*

Categories Pane

The Categories pane is the left-most pane in the Main Screen and presents the highest-level information about the overall system status. The Categories pane has two tabs: Diagnostics and System.

When maximum and minimum levels of operation for various components in the system are exceeded, APDiagnostics flags that information as warnings or errors (depending on the data received) by changing the color of the Categories buttons in the Categories pane to yellow for warning or red for error and by displaying the information as Warnings or Errors in the Event Status Notebook.

Diagnostics Tab

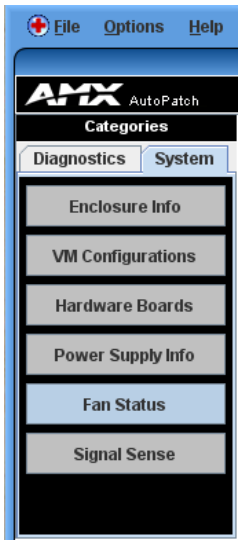


The two buttons on the Diagnostics tab (Temperature and Power System) will turn green, yellow, or red indicating Good, Warning, or Error state, respectively. A yellow for warning or red for error button indicates that the maximum or minimum levels of functioning for various components in the system has been exceeded. This allows you to "drill down" into that particular system for more detailed information about the state of its lowest-level constituents.

To display diagnostic information for Temperature and Power System groups:

1. In the Categories pane, select the Diagnostics tab.
2. Click either the Temperature or Power System button. Visual, Plot, and Details buttons display in the Information pane (see page 131).

System Tab



The six buttons on the System tab offer general information for the following

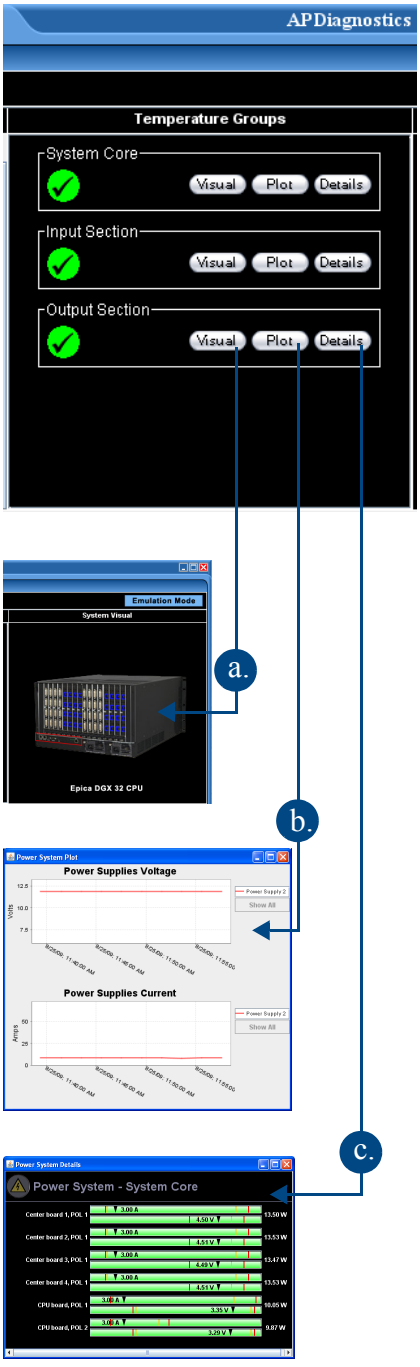
- Enclosure Info
- VM Configurations
- Hardware Boards
- Power Supply Info
- Fan Status*
- Signal Sense (for inputs and outputs)

To display general information for a particular component:

1. In the Categories pane, select the System tab.
2. Click one of the buttons on the System tab.
   The details display in the Information pane (see page 131).

* A fan should be replaced if the speed drops significantly lower than its setting value, indicating that it will eventually fail. If a fan has failed completely, its speed will be reported as 0 RPM.

Information Pane



The Information pane is the center panel in the Main Screen and offers the next level of "drill down" into the system status. Information pane buttons access information for each of the specific group components listed. The type of information displayed in the Information pane depends on which tab is active in the Categories pane and which Categories button is selected.

To display diagnostic information:

1. In the Categories pane, select the Diagnostic tab.
2. Select either the Temperature or Power System buttons as applicable.
3. In the Information pane:

a. Click the Visual button to display visual details on the enclosure in the System Visual pane.
For more information, see page 133.

b. Click the Plot button to display a Plot View with a graph of data points for information being gathered (Acquisition mode) or already gathered (Emulation mode) for a specific component. The data is date stamped as it is added to the graph.
For more information, see page 132.

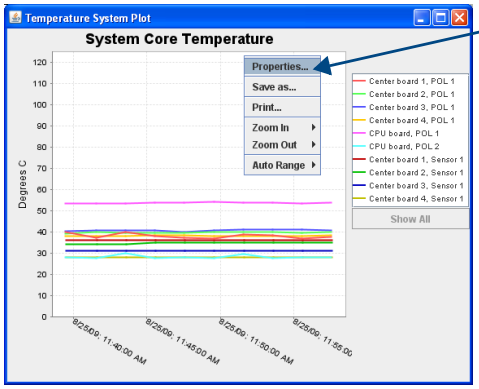
c. Click the Details button to display a set of analog status meters each representing current data for its associated component. The meters provide an analog representation of a component's current value with respect to its Warning and Error setpoints. If the value is below its minimum or exceeds its maximum Warning or Error setpoint, the color of the meter changes from green (Good) to yellow (Warning) or red (Error), making it easy to identify problem areas at a glance.

Information Pane Plot Views

A Plot Views window displays a graph of data points for the components for which it is associated. The graph has a legend at the right and is time-stamped in intervals across the bottom. The amount of historical data points presented in the graph can be determined by changing the settings in the Application Preferences dialog box (see page 135).

Legend items in a Plot View are selectable; doing so will filter the view so that only the selected items are displayed. Furthermore, if only a single item is selected, its Warning and Error setpoint values will also display in the window for reference.

Tip: *For a hard copy of a graph, save as a .png file, then print the .png.*



To access graph options:

1. Right click on the graph and select a shortcut menu item.

Properties – opens a Chart Properties dialog box with three tabs: Title, Plot, and Other.

Save as – opens a standard Save dialog box.

Print – opens a standard Page Setup dialog box.

Zoom In – provides options to zoom in on Both Axes, Domain Axis, or Range Axis.

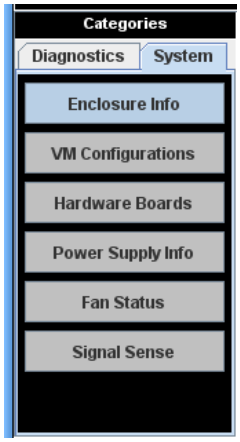
Zoom Out – provides options to zoom out on Both Axes, Domain Axis, or Range Axis.

Auto Range – provides options for auto display of Both Axes, Domain Axis, or Range Axis.

For information on changing the viewing of the graph, see the APDiagnostics Help file.

To display System information:

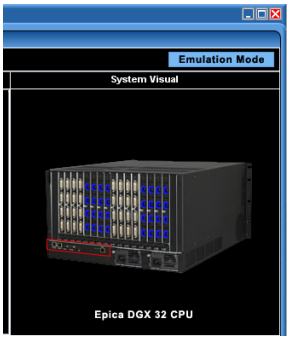
1. In the Categories pane, select the System tab.
2. Click the desired System button to display its corresponding details in the Information pane:



- **Enclosure Info** – XNNet ID, Firmware Version, Host IOS Version, and FW (Firmware) Build Date.
- **VM Configurations** – A table with the VM Name, VM Number, Inputs, and Outputs.
- **Hardware Boards** – A table with board numbers for Inputs, Outputs, and Center boards.
- **Power Supply Info** – Model number, Serial number, Revision, and Service Hours for each power supply. (If a power supply is listed as "not reporting," either it is not physically present or it is not being reported by the enclosure.)
- **Fan Status** – a table indicates Fan #, Speed (RPS), and Health with an icon for wellbeing (green check mark, yellow !, or red !).
- **Signal Sense** – A table indicates whether a signal is present on each of the input and output channel connections on the switcher. The signal may or may not be routed, but the source device must be connected and powered on for the table to indicate that the signal is present.

Note: *The Signal Sense table does not show crosspoint status.*

System Visual Pane



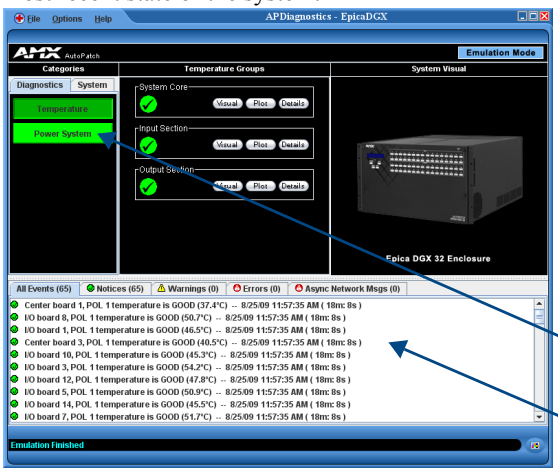
The System Visual pane is the right-most panel in the Main Screen and presents a simple graphic representation of the different groups being monitored by the application.

To display an appropriate image in System Visual pane:

1. In the Categories pane, select the Diagnostics tab.
2. In the Information pane, click the Visual button for the applicable Temperature Groups.

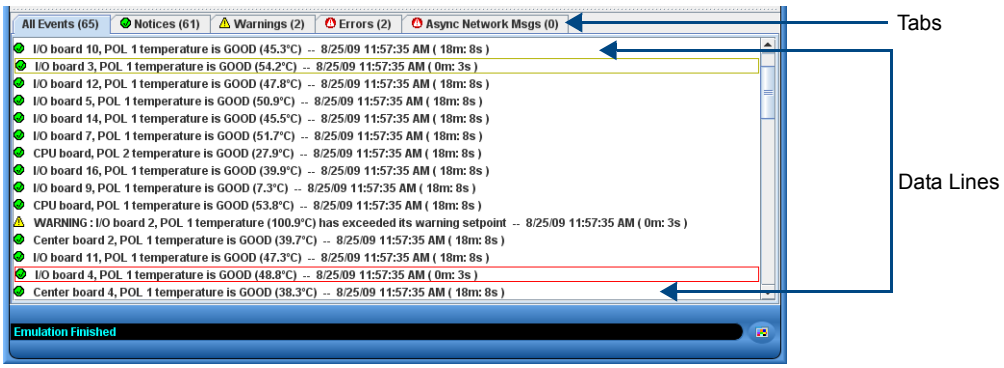
Event Status Notebook

The Event Status Notebook is the panel with five tabs at the bottom of the Main Screen. The tabs in the Event Status Notebook provide current data (Acquisition mode) or previous data (Emulation mode). It provides updated status entries as the system is being monitored, providing a snapshot glance of the most recent state of the system.



When components in the system exceed their maximum and minimum levels of operation, APDiagnostics flags that information as warnings or errors depending on the data received. APDiagnostics changes the color of the Categories buttons in the Categories pane (top arrow) to yellow for warning or red for error and displays the information as Warnings or Errors in the Event Status Notebook (bottom arrow).

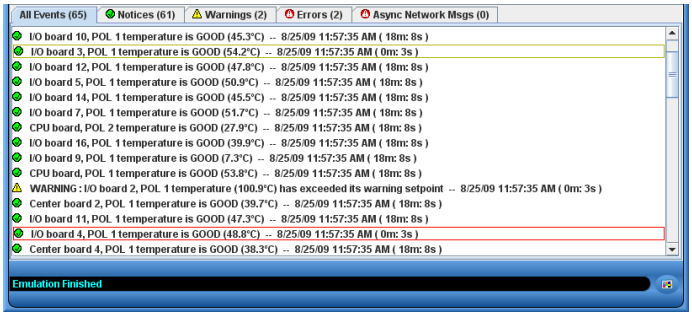
The information displayed in the Event Status Notebook is sorted under the following tabs: All Events, Notices, Warnings, Errors, and Async Network Msgs (Messages).


All Events (65)
Notices (61)
Warnings (2)
Errors (2)
Async Network Msgs (0)
I/O board 10, POL 1 temperature is GOOD (45.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 3, POL 1 temperature is GOOD (54.2°C) -- 8/25/09 11:57:35 AM (0m: 3s)
I/O board 12, POL 1 temperature is GOOD (47.8°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 5, POL 1 temperature is GOOD (50.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 14, POL 1 temperature is GOOD (45.5°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 7, POL 1 temperature is GOOD (51.7°C) -- 8/25/09 11:57:35 AM (18m: 8s)
CPU board, POL 2 temperature is GOOD (27.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 16, POL 1 temperature is GOOD (39.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 9, POL 1 temperature is GOOD (7.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
CPU board, POL 1 temperature is GOOD (53.8°C) -- 8/25/09 11:57:35 AM (18m: 8s)
WARNING : I/O board 2, POL 1 temperature (100.9°C) has exceeded its warning setpoint -- 8/25/09 11:57:35 AM (0m: 3s)
Center board 2, POL 1 temperature is GOOD (39.7°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 11, POL 1 temperature is GOOD (47.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 4, POL 1 temperature is GOOD (48.8°C) -- 8/25/09 11:57:35 AM (0m: 3s)
Center board 4, POL 1 temperature is GOOD (38.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
Emulation Finished
Tabs
Data Lines

Note: *A yellow or red outline around a data line indicates that the component was previously in a Warning or Error state.*

To view information in the Event Status Notebook:

1. Click the applicable tab:
   - **All Events –** comprehensive and sequential listing of all Notices, Warnings, and Errors
   - **Notices (green checkmark)** – data list collected indicating a status of "Good"
   - **Warnings (yellow !)** – data list collected that indicates the Warning set point (high or low) has been exceeded
   - **Errors (red !) –** data list collected that indicates an Error state, i.e., has surpassed or exceeded its allowable maximum or minimum set point
   - **Async Network Msgs (red !) –** list of asynchronous messages received from the connected enclosure that indicate a condition that may need to be addressed


All Events (65)
Notices (61)
Warnings (2)
Errors (2)
Async Network Msgs (0)
I/O board 10, POL 1 temperature is GOOD (45.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 3, POL 1 temperature is GOOD (54.2°C) -- 8/25/09 11:57:35 AM (0m: 3s)
I/O board 12, POL 1 temperature is GOOD (47.8°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 5, POL 1 temperature is GOOD (50.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 14, POL 1 temperature is GOOD (45.5°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 7, POL 1 temperature is GOOD (51.7°C) -- 8/25/09 11:57:35 AM (18m: 8s)
CPU board, POL 2 temperature is GOOD (27.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 16, POL 1 temperature is GOOD (39.9°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 9, POL 1 temperature is GOOD (7.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
CPU board, POL 1 temperature is GOOD (53.8°C) -- 8/25/09 11:57:35 AM (18m: 8s)
WARNING : I/O board 2, POL 1 temperature (100.9°C) has exceeded its warning setpoint -- 8/25/09 11:57:35 AM (0m: 3s)
Center board 2, POL 1 temperature is GOOD (39.7°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 11, POL 1 temperature is GOOD (47.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
I/O board 4, POL 1 temperature is GOOD (48.8°C) -- 8/25/09 11:57:35 AM (0m: 3s)
Center board 4, POL 1 temperature is GOOD (38.3°C) -- 8/25/09 11:57:35 AM (18m: 8s)
Emulation Finished

Data lines display for every component that is queried and provide:

- "Green checkmark" (Notice) or "yellow !" (Warning) or "red !" (Error)
- Component description (e.g., Center board 2, POL 2 power)
- General status description (e.g., GOOD, has surpassed . . ., has exceeded . . ., etc.)
- Date/time stamp for the event (e.g., 8/03/07 5:15:50 PM)
- Elapsed time in minutes and seconds that the component has been in that state (e.g., 7m:25s)

To access a data line context menu:

1. Select and then right-click a data line in a list. The context menu options are:
   - Show Graph – opens a Plot View of the data points for that component
   - Icon/Date/time stamp* (information only; not selectable) – indicates the most recent time that the component was in that respective state
   - Reset Selected Item*
   - Reset All Items

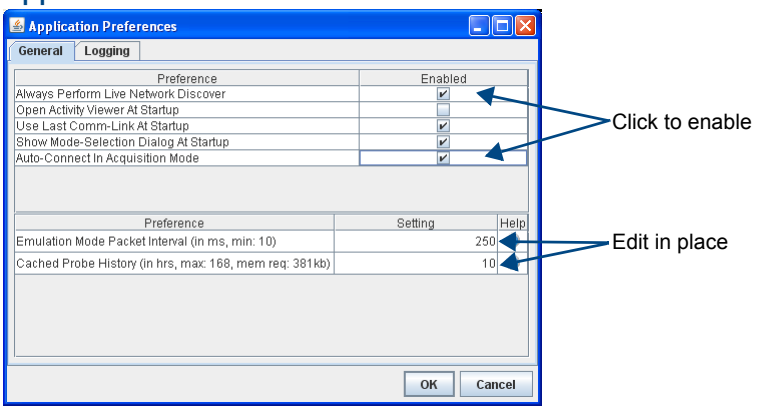
* These menu items only appear when a data line is outlined in yellow or red.

Types of Files

The following three types of files are zipped and archived. The file name for each includes the date and time zipped: for example, Diagnostic_03.02.09_14.24.50.zip (zipped on March 2, 2009 at 2:24:50 pm).

- **Log (.apd, .zip)** – contains all data displayed in the APDiagnostics interface in text format. Can be loaded when the program is opened in Emulation mode to view data for trend analysis and troubleshooting; see page 137.
- **Packet (.acp)** – contains all system activity data (packet transactions between APDiagnostics and the enclosure) in libpcap format. Advanced users can open .acp files with a packet/network analyzer, such as "Analyzer" (http://analyzer.polito.it/).
- **Activity (.log)** – displays system activity in the Activity Log dialog box in text format.

Application Preferences



To access the Application Preferences dialog box and set preferences:

1. Select Options > Preferences.
   The Preferences dialog box has two tabs: General and Logging.

General Tab

To set general application preferences:

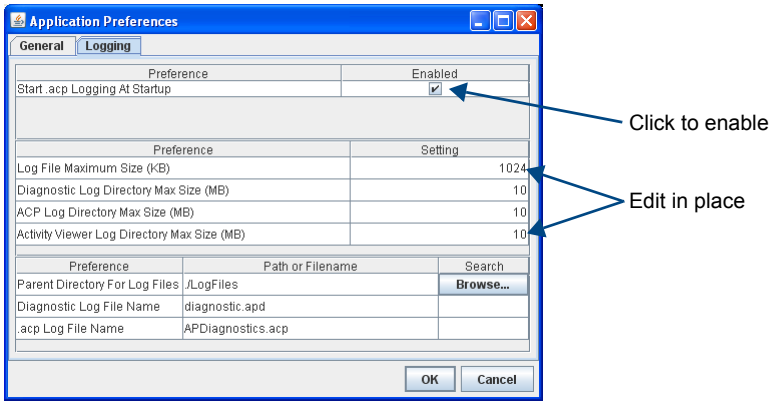
1. For the upper set of preferences, click the applicable Enabled check boxes.
   - Always Perform Live Network Discover* (selected by default)
   - Open Activity Viewer at Startup
   - Use Last Comm-Link at Startup (selected by default)
   - Show Mode-Selection Dialog at Startup (selected by default)
   - Auto-Connect in Acquisition mode (selected by default)
2. For the lower set of preferences, edit information in place (Help boxes appear).
   - Emulation Mode Packet Interval
   - Cached Probe History
3. Click OK.

* If this preference is “off,” the program will use the last XNNet ID stored in its registry (and expects that enclosure to be present).

When processing a set of archived files in Emulation mode for analysis, you can control how fast or slow the files are processed by adjusting the “Emulation Mode Packet Interval” setting on the General tab of the Application Preferences dialog box. If you are viewing graphs while the data is being processed, specifying a larger interval value will allow the program to be more responsive as the Plot Views can be processor intensive in the face of fast playbacks.

Important: *APDiagnostics keeps a cache of historical data points in memory for status of all components that it monitors. These data points can then be displayed in the Plot Views for trend analysis. You can control the amount of system memory APDiagnostics will use for this historical data by setting the “Cached Probe History” value on the General tab. (The Max. Cached Probe History is 168 hours. For default values, see the dialog box.) Large history sets may impede performance of the application, so set this value in accordance with the resources available on the target PC.*

Logging Tab



To set the preference for Start .acp Logging At Startup:

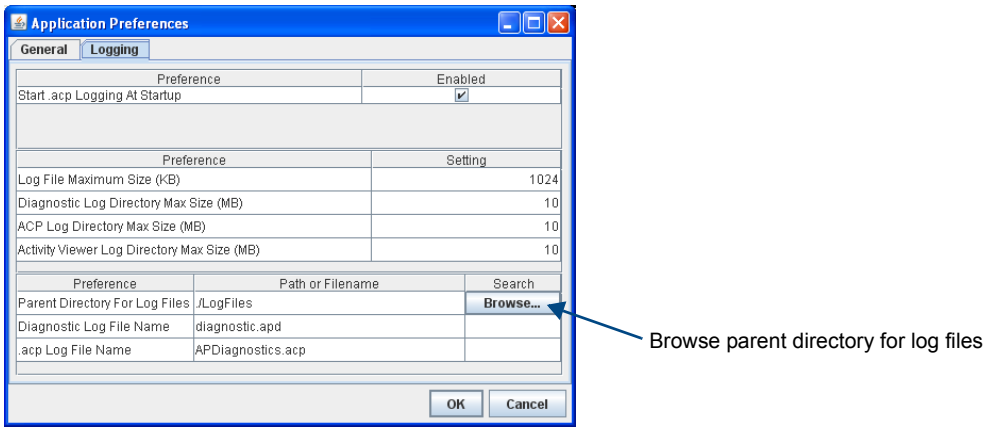
1. Click the Enabled check box.
2. Click OK.

To change settings:

1. Edit in place (for default values, see the dialog box):
   - Log File Maximum Size*
   - Diagnostic Log Directory Max Size
   - ACP Log Directory Max Size
   - Activity Log Viewer Directory Max Size
2. Click OK.

* Log files are automatically zipped when the maximum size specified in this field is reached. This size value applies to all three log file types.

Tip: *The amount of disk space allocated for archived files can be controlled by specifying the amount of disk space to allocate for each of the three file types that are generated and archived while APDiagnostics is running in Acquisition mode. You can also specify how big the active Log file should get before it is archived and a new one is started. These parameters are specified on the Logging tab.*



To specify the root level folder for storing all Log files:

1. Browse the parent directory for log files.

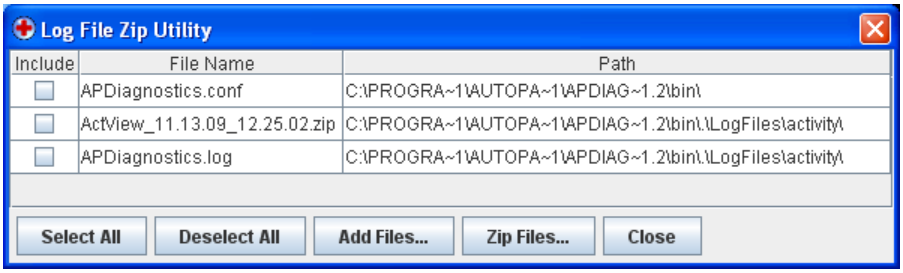
   Once specified, the files are stored as follows:

   - .apd files in a subfolder named “diagnostic”
   - .acp in a subfolder named “acp”
   - .log files in a subfolder named “activity”

Note: *The “Diagnostic Log File Name” and the “.acp Log File Name” can be changed by editing in place, but cannot have a specified path.*

Zip Log Files

In the event that you need to zip a set of files and send them to technical support, use the Log File Zip Utility dialog box to create a single archive file to email.



To zip log files:

1. Select File > Zip Log Files.
2. Under Include, click the check box for each of the files needing zipped.
   - Click individually or use any of the first three option buttons along the bottom.
   - Select multiple, consecutive files by holding down the Shift key and clicking the first and last files in a range of files.
   - Select multiple, nonconsecutive files by holding down the Control key and clicking on individual files.
3. Click the Zip Files button.
4. Click Close.

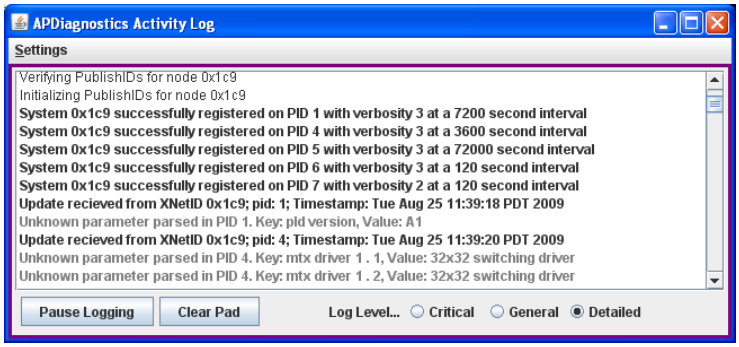
Load Log Files (Emulation Mode Only)

To load log files:

1. Select File > Load Log File.
2. From the Open dialog box, navigate to the location the application is storing the .apd files (the default location is LogFiles > Activity in the installation directory).
3. Open the desired .apd and/or .zip file(s). The Status bar at the bottom indicates which file is being processed (for example, “Processing file 2 of 3”).

Activity Log

A diagnostics window where all activity is logged in detail keeps track of the application's activity while it is running. The logging can be paused and resumed as required. The logged information can also be deleted (Clear Pad). The level of logging can be specified as: Critical, General (default), or Detailed.


APDiagnostics Activity Log
Settings
Verifying PublishIDs for node 0x1c9
Initializing PublishIDs for node 0x1c9
System 0x1c9 successfully registered on PID 1 with verbosity 3 at a 7200 second interval
System 0x1c9 successfully registered on PID 4 with verbosity 3 at a 3600 second interval
System 0x1c9 successfully registered on PID 5 with verbosity 3 at a 72000 second interval
System 0x1c9 successfully registered on PID 6 with verbosity 3 at a 120 second interval
System 0x1c9 successfully registered on PID 7 with verbosity 2 at a 120 second interval
Update recieved from XNetID 0x1c9; pid: 1; Timestamp: Tue Aug 25 11:39:18 PDT 2009
Unknown parameter parsed in PID 1. Key: pld version, Value: A1
Update recieved from XNetID 0x1c9; pid: 4; Timestamp: Tue Aug 25 11:39:20 PDT 2009
Unknown parameter parsed in PID 4. Key: mtx driver 1 . 1, Value: 32x32 switching driver
Unknown parameter parsed in PID 4. Key: mtx driver 1 . 2, Value: 32x32 switching driver
Pause Logging
Clear Pad
Log Level... Critical General Detailed

To select options in the Activity Log:

1. Select Options > Show > Activity Log.
2. Click Pause Logging or Clear Pad as needed (change Log Level if desired).

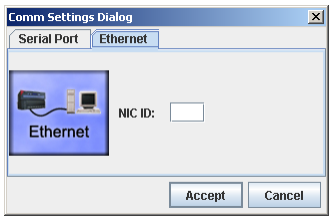
Communications

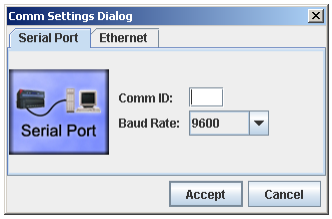
APDiagnostics communicates with a single enclosure at a time in Acquisition mode. (Only a single instance of the application can run on a PC when in Acquisition mode.)

Note: *The Comm menu item is available only in Acquisition mode because communication with a system is not required to run APDiagnostics in Emulation mode.*

The communication link can be disconnected at anytime (thus freeing up the Comm port for use by other applications) and then reconnected when needed. The program will reset itself when the reconnection occurs. Due to the potentially high volume of information being processed from the attached enclosure, we recommend using the Ethernet connection whenever possible.

To change the Comm Settings (in Acquisition mode only):





1. Select Comm > Settings.
2. **Ethernet** – Select the Ethernet tab and set the NIC ID*.
   Or
   Serial Port – Select the Serial Port tab and set the Comm ID and baud rate (default 9600).
3. Click Accept.

* If the NIC ID (MAC Address) is not already displayed, you can find it by going to the Start menu at the lower left of your monitor: 1) Select Start/Settings/Control Panel. 2) Open Network Connections. 3) Right click on the Local Area Connection (under LAN or Internet) and select Properties. 4) Hover the mouse pointer over the entry in the Connect Using field to display the MAC Address (e.g., 00-1E-4F-A1-82-5D).

Appendix D – Programmer's Interface for System Diagnostics

System Component Information

The Epica DGX 16 and 32 display system information in their splash screens* for diagnostic purposes. The information indicates the current status and well-being of the system components.

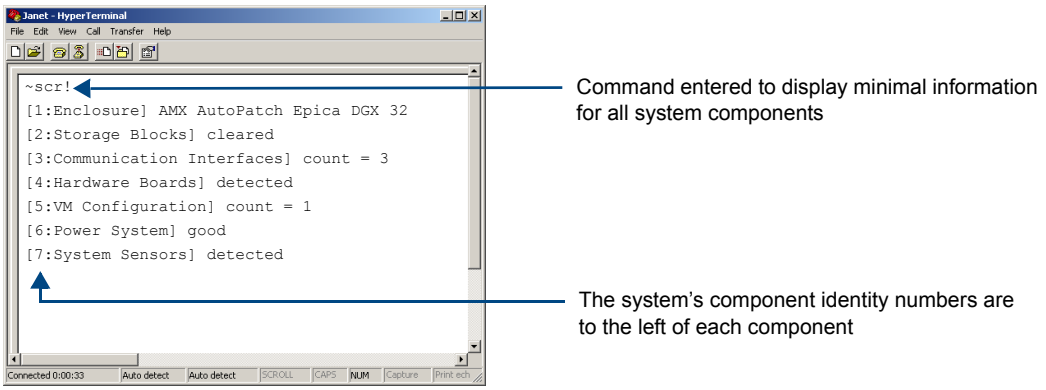


FIG. 61 Example of a default Epica DGX 32 splash screen

The splash screen can be accessed using a terminal emulation program, such as HyperTerminal (see page 29). One of four verbosity** settings is specified, which provides either a list of the seven system components with minimal information (FIG. 61) or a level of detailed information on one of the seven components. Only one verbosity setting and one component setting can be entered in a command. The order in which the verbosity and component settings are entered is interchangeable.

Note: *In a multiple-enclosure system, the splash screen displays information only for the enclosure that is connected directly to the PC.*

* AMX reserves the right to add to the contents of the splash screen at any time, without notice.

** Verbosity (i.e., wordiness) refers to the amount of information provided; the higher the verbosity setting, the more information is displayed.

Verbosity Settings

The verbosity (`v`) settings (`v0`, `v1`, `v2`, `v3`) correspond to the level of detail that will be displayed, with `v0` being the lowest level of detail and `v3` being the highest level.

Component Identity Settings

Detailed information for a single system component can be specified by using its identity (`i`) number setting (`i1` through `i7`) in the following table. Minimal information for all seven components an be specified by using the identity number `i0`.

Component	Identity Number
All Components	`i0`
Enclosure	`i1`
Storage Blocks	`i2`
Communication Interfaces	`i3`
Hardware / Boards	`i4`
VM Configuration	`i5`
Power System	`i6`
System Sensors	`i7`

Default Settings

- At system boot, the `~scrv0i1` setting is displayed (FIG. 62 on page 141).
- If the verbosity setting is omitted, the verbosity level will be the lowest (`v0`).
- The component setting must be included; otherwise, entering any of the verbosity settings alone will result in a display equivalent to `v0i0`.
- If both settings are omitted during a query (`~scr!`), the information displayed will be at the lowest verbosity level for all components (`v0i0`) (FIG. 61 on page 139).

Using BCS to Access System Diagnostic Information

Instructions are provided for accessing the lowest level of verbosity for all components and for accessing a specific level of verbosity for a specific component.

To access the lowest level of verbosity for all components:

1. Enter `~scr!` or `~scrv0i0!`

Note: *Either of these commands provides a "menu" of the identity numbers and their corresponding components (FIG. 61 on page 139).*

Only one verbosity setting and one component setting can be entered in a command. The order in which the verbosity and component settings are entered is interchangeable.

To access a specific level of verbosity for a specific component:

1. Enter `~scr` (to access the splash screen).
2. Enter the verbosity level setting `v#` and the component identity setting `i#`.
   Either may be specified first.
3. Enter `!` (to send the command).

Example

`~scrv3i6!` or `~scri6v3!` (Either displays the highest level of detail for the Power System.)

Splash Screen Examples

Note: *AMX reserves the right to add to the contents of the splash screen at any time, without notice.*

Power-Up Splash Screen

The first example is of the splash screen that displays when power is applied to the enclosure. When "`Ready`" appears, BCS commands can be entered for executing switches, verifying status, querying the system for diagnostic information, etc.

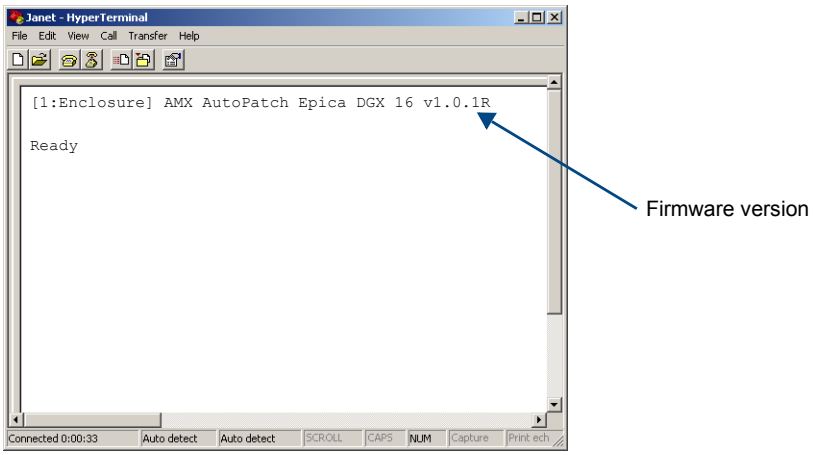


FIG. 62 Power-up splash screen in HyperTerminal

Splash Screens Displaying System Information

Following are five examples of splash screen information from an Epica DGX 16 that could display when different verbosity/component settings are specified. Depending on the amount of detail provided, you may need to scroll to see the entire display.

The command in the first example, `~scrv3i1`, can be used to check the host software (IOS) version and the hardware driver (appcode) version.

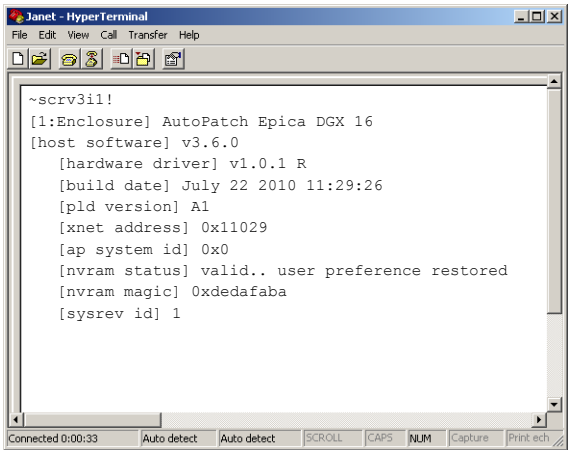


FIG. 63 Display for v3i1 (verbosity 3, component 1)

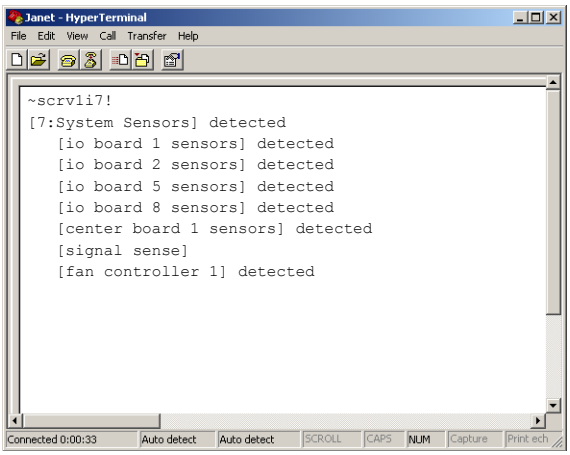


FIG. 64 Display for v1i7 (verbosity 1, component 7)

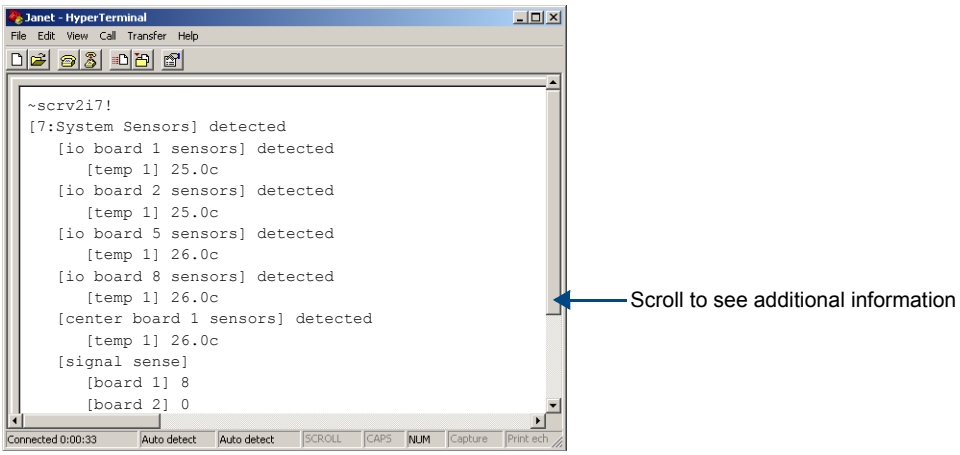


FIG. 65 Display for v2i7 (verbosity 2, component 7)

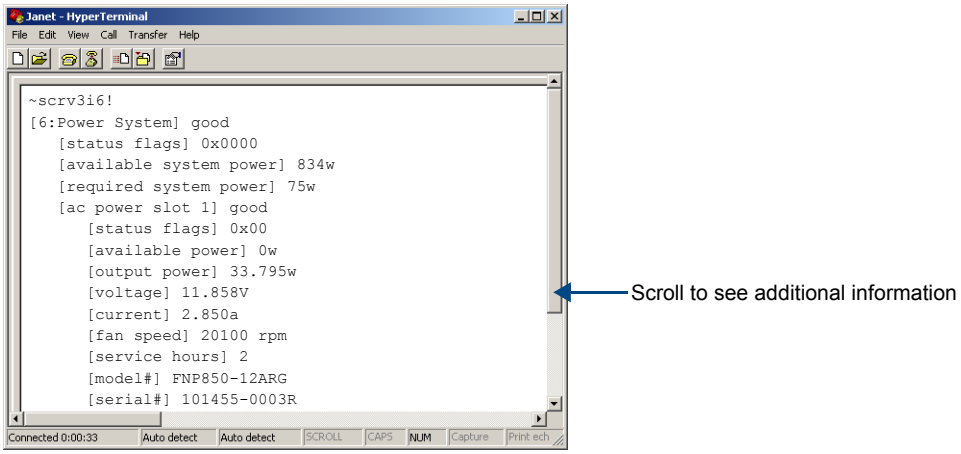


FIG. 66 Display for v3i6 (verbosity 3, component 6)

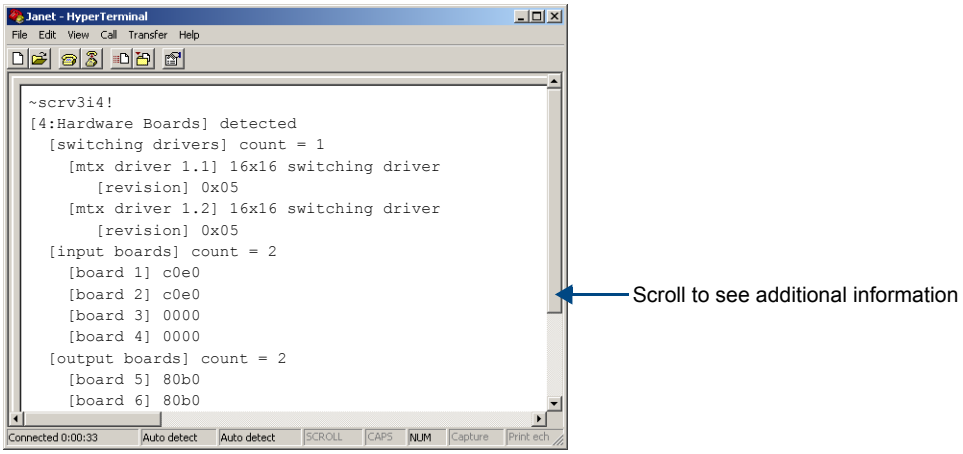


FIG. 67 Display for v3i4 (verbosity 3, component 4)

Appendix E – Board Replacement

Applicability

This appendix covers the removal and replacement procedure for boards for input and output boards for the Epica DGX 16 and 32 (see tables). Epica DGX boards are hot-swappable, i.e., the procedure can be done while the system is powered up (see the "Caution" at the bottom of this page).

Epica DGX SC Optical Boards

Type	FG #	Model
Input	FG1056-500	AVS-EPDGX32-OI-SC
Output	FG1056-510	AVS-EPDGX32-OO-SC

Epica DGX DVI Boards

Type	FG #	Model
Input	FG1056-520	AVS-EPDGX32-VI-DVI
Output	FG1056-530	AVS-EPDGX32-VO-DVI

Procedure Overview

Important: *Adding or replacing boards should only be done by personnel trained to handle ESD sensitive parts and assemblies.*

ESD Warning: *To avoid ESD (Electrostatic Discharge) damage to sensitive components, make sure you are properly grounded before touching any internal Epica DGX 16 or 32 materials. Use an ESD wristband and cord with an alligator clip attached to a good ground source.*

Items Required

- Epica DGX board(s)
- Phillips #1 screwdriver
- ESD wristband and cord with alligator clip
- PC with a terminal emulation program (e.g., HyperTerminal) and an RS-232 null modem cable

Caution: *The safety recommendations for laser products include applying power last. If instead of powering down during the board replacement procedure, you decide to take advantage of the DGX SC Optical board's ability to hot-swap, be sure that you follow the rest of the laser safety recommendations on the next page and in the instructions when replacing a DGX SC Optical board.*

Safety Recommendations for Laser Products

Important: *No user serviceable parts are included inside an AMX AutoPatch product; service should only be done by qualified personnel.*

Caution: *Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.*

Exercise caution when installing DGX SC Optical Boards to avoid direct eye exposure to invisible laser radiation. Follow the recommendations below whenever installing or working with DGX products.

- ❑ Be sure to apply the power only after all fiber connections are made and no fiber ends are exposed.
- ❑ Do *not* remove dust plugs from SC fiber connectors or the dust caps from the fiber cables until establishing connections; avoid direct eye exposure.
- ❑ Make sure all cables, including fiber cables, are correctly connected and/or terminated.
- ❑ Before you unplug a fiber cable on an input board, disconnect the power on the DGX TX that is connected to the input.
- ❑ Before you unplug a fiber cable on an output board, disconnect the switch for that output connector.

Replacing or Adding a Board

Important: *When replacing a board, be sure to install the new board in the same slot that held the original board to make sure the switching commands are correct.*

In almost all cases, Epica DGX 16 and 32 systems are configured to accommodate a full enclosure's worth of boards and do *not* require modification to the configuration file when a board is added. If you cannot execute switches with the new board after it has been installed, the configuration file may need to be updated; see "Board Troubleshooting" on page 149.

Caution: *Cable management bars are not to be used as handles to remove or install boards.*

In the following procedure, read each step entirely. The steps include helpful tips to avoid damage to the enclosure's internal cables and connectors.

To remove and replace an Epica DGX 16 or 32 Board:

1. Optional for systems with SC Optical boards – Power down the enclosure (see the "Caution" at the bottom of page 145).
2. **Epica DGX 32 only** – Loosen the two captive screws (one on each end) that hold the connector numbering plate at the top of the boards, and set the plate aside.

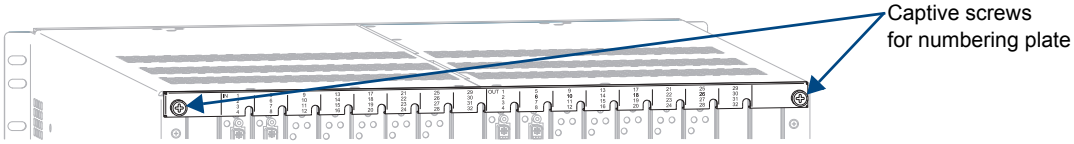


FIG. 68 Epica DGX 32 only - captive screws hold numbering plate at top of boards

3. If applicable – Label and disconnect all cables on the board being replaced. If cables from adjoining boards obstruct access, label and disconnect them as necessary.
   If the system is not powered down:
   - **For disconnecting a DGX SC Optical input board** – Before disconnecting the fiber cables, disconnect the power on the DGX TX Transmitter modules that are connected to the inputs.
   - **For disconnecting a DGX SC Optical output board** – Before disconnecting the fiber cables, disconnect the switches for those output connectors.

4. **Blank board plate** – Remove the screw that holds the board plate in place (for the Epica DGX 32, see FIG. 69; for the Epica DGX 16, see FIG. 70). Pull the plate out of the board slot opening (the tab on the end of the board plate fits in a slot near where the ejector handle would otherwise go). The plate consists of an aluminum sleeve with a black metal piece, which slides in and out of the sleeve.
   Or
   Current board – Remove the pan head screw that holds the board in place (for the Epica DGX 32, see FIG. 69; for the Epica DGX 16, see FIG. 70). Push on the board's extractor handle as far as it will go (about a 45° angle). With the handle extended, carefully pull the board straight out of the board slot. Place the board in an ESD approved static shield bag and set aside.

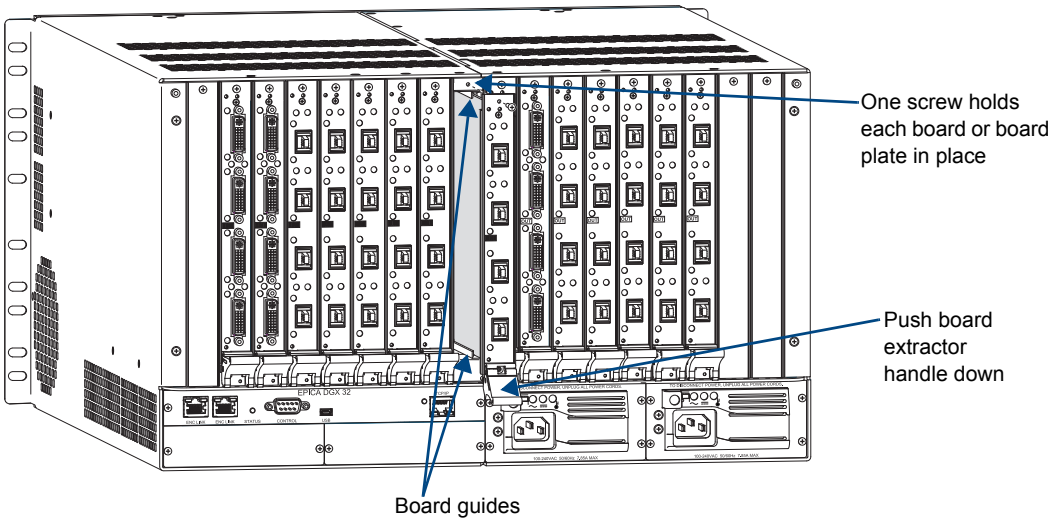


FIG. 69 Epica DGX 32 - Remove screw, push board extractor handle down, and then pull board straight out

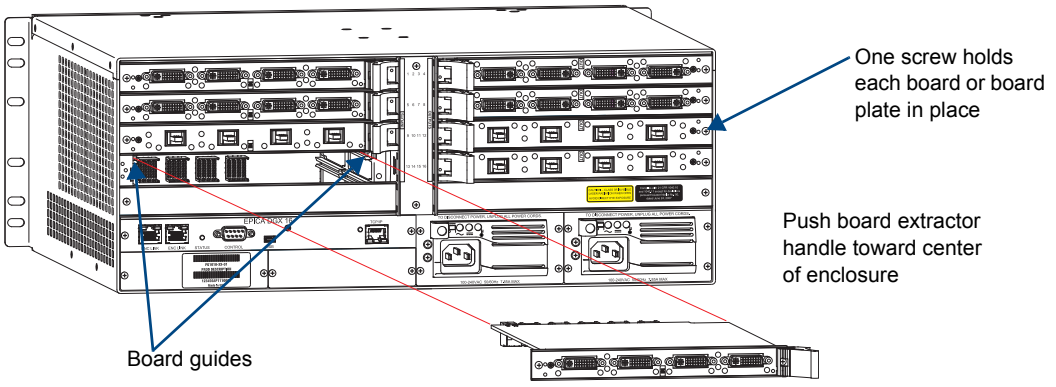


FIG. 70 Epica DGX 16 - remove screw, push board extractor handle right (input) or left (output), pull board straight out

Caution: *Each Epica DGX 16 and 32 board has an EMI (Electromagnetic Interference) gasket along one edge of the face plate. Handle the boards carefully to avoid dislodging or damaging the gasket on the board being installed and the gasket on the adjacent board or blank plate.*

Caution: *For SC Optical boards, do not remove dust plugs from SC fiber connectors until Step 11.*

5. **New board for an Epica DGX 32** – With the board's extractor handle in the extended (unlocked) position, line up the board's edges on the board guides that are along the top and bottom of the board slot (FIG. 69).
   New board for an Epica DGX 16 – With the board's extractor handle in the extended (unlocked) position, line up the board's edges on the board guides that are along the left and right of the board slot (FIG. 70). Note that Input boards have board guides at the top of the slot and board guides for the Output boards are at the bottom of the slot due to their reversed orientation in the enclosure.

6. Begin pushing the board into the slot until the extractor handle starts to engage the metal extractor plate (the extractor handle moves into its folded position).
   When the extractor handle starts to lift, flip the handle toward the center of the board until it snaps into its folded (locked) position (which firmly seats the board).
7. Fasten the screw (which was removed in Step 4) that holds the board in place.
8. If the enclosure was powered down – Reapply power.
9. Verify that the system recognizes the board:
   a. Attach a PC to the serial port on the enclosure with an RS-232 null modem cable (pinout: 5 GND to 5 GND, 2 RXD to 3 TXD, and 3 TXD to 2 RXD).
   b. Open HyperTerminal (typically at start/Programs/Accessories/Communications/HyperTerminal) and set the port settings to: baud rate = 9600, data bits = 8, stop bit = 1, parity = none, and flow control = none.
   c. Enter `~scri4v3!`
   d. Check to be sure the new board is included in the list (FIG. 71). If not, reseat the board and enter the command again.
   (*Do not disconnect HyperTerminal until after Step 13 is successful.)*

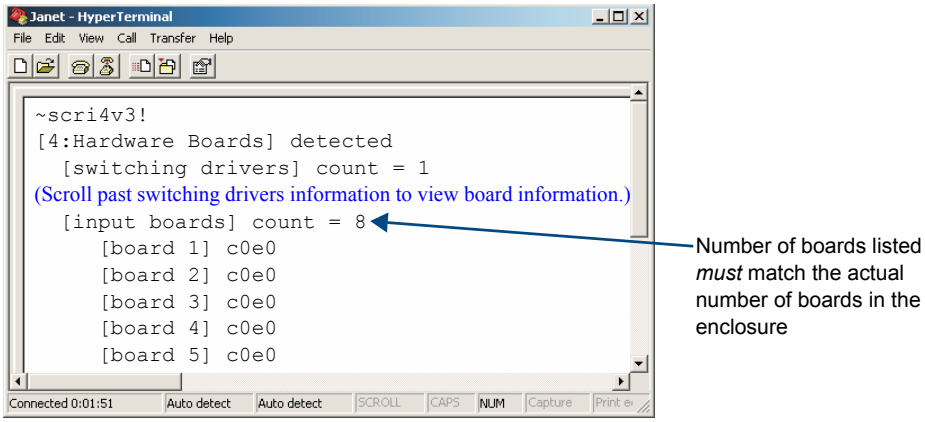


FIG. 71 Splash screen showing boards in the system (Epica DGX 32 example with 8 input boards)

10. If applicable – Attach the cable management bar (do *not* over tighten screws).

Note: *If using a cable management bar, tie the cable to the cable management bar far enough below the connector to allow for the manufacturer's recommended bend radius. The bend radius for AMX SC terminated fiber cables is 2 inches (5 cm).*

11. Attach the cables to the board's connectors* and reconnect any other cables that were disconnected in Step 3 (if applicable – tie cables to cable management bars).
    If the system is not powered down:
    - For connecting a DGX SC Optical input board – Avoid direct eye exposure as you (a) remove the dust plugs from the SC fiber connectors on the board, (b) remove the dust caps from the fiber cables, (c) establish the connections, and (d) apply power to the DGX TX Transmitter modules that are connected to the inputs.
    - For connecting a DGX SC Optical output board – Avoid direct eye exposure as you (a) remove the dust plugs from the SC fiber connectors on the board, (b) remove the dust caps from the fiber cables, and (c) establish the connections.
12. If the enclosure was powered down – Reapply power.

*If you need cabling information, see the specific board chapter in this manual.

13. Execute a test switch using a connection on the new board (see page 40).
    If the test switch does not work, see "Board Troubleshooting" below.
14. **Epica DGX 32 only** – Replace the connector numbering plate that was removed in Step 2.

Board Troubleshooting

If you cannot execute switches with the new board after it has been installed, the first thing to do is verify the configuration of the system by entering `~scri5v3!` in the splash screen (FIG. 72). This command retrieves information on the crosspoint size of the virtual matrices (VMs).

The default configuration that ships with almost all systems includes two VMs (VM 0 and VM 1) with the crosspoint size for each set at a full 32x32 for an Epica DGX 32 (eight input and eight output boards) and at 16x16 for an Epica DGX 16 (four input and four output boards).

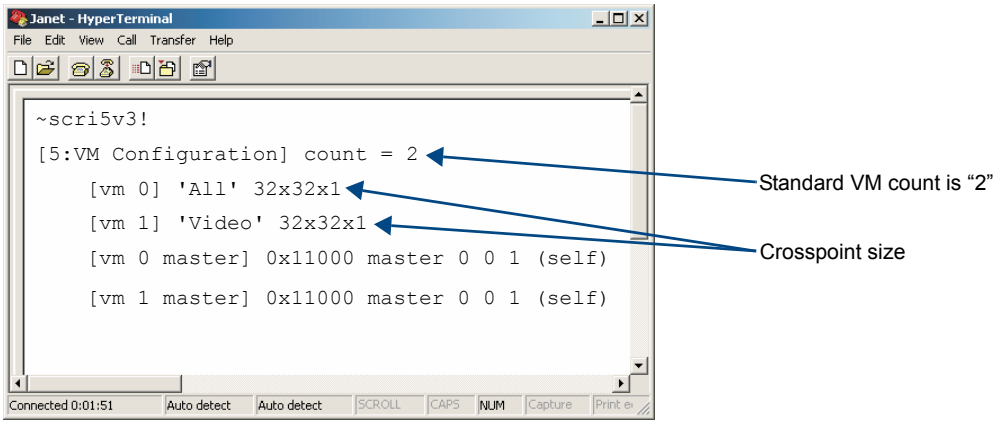


FIG. 72 Splash screen information indicating a standard configuration file for an Epica DGX 32

If the crosspoint size is less than full (e.g., 24x24 in an Epica DGX 32) and the new board increases the size past the size indicated on the splash screen, then the system was customized for a non-standard crosspoint size that is not large enough to accommodate the new board. The configuration file *must* be updated before the new board will work (see "Updating the Configuration File" below).

If the crosspoint size is large enough to accommodate the new board and you still cannot execute switches, contact technical support (see page 42).

Updating the Configuration File

If the configuration file requires updating (as explained in the previous section), read both choices listed to determine how to proceed.

- If the system's configuration file has *not* been modified since it was shipped from the factory, enter `~def!` in the splash screen to establish the default configuration of 16x16 or 32x32 with two VMs.
- If the original configuration has been modified in any way (e.g., local presets were added), we recommend sending a copy of the modified file to technical support (see page 42), so they can add support for the board change to the modified file before you download the file to the CPU (requires XNConnect).

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